CITY OF SUNNYVALE

STANDARD SPECIFICATIONS

FOR PUBLIC WORKS CONSTRUCTION

2000 EDITION

AND

STANDARD DETAILS

FOR PUBLIC WORKS CONSTRUCTION

2000 EDITION

DEPARTMENT OF PUBLIC WORKS

July, 2000

CITY OF SUNNYVALE

STANDARD SPECIFICATIONS

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2000 EDITION

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Department of Public Works
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PART 1 — GENERAL PROVISIONS

Part 1 — General Provisions, shall consist of the General Provisions of the "Greenbook" Standard Specifications for Public Works Construction, 2000 Edition, written and promulgated by Public Works Standards, Inc., as modified below.

SECTION 1 — TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

Pages 1 and 2

UNDER **SUBSECTION 1-2**, REVISE THE DEFINITIONS OF "AGENCY," "BOARD," AND "ENGINEER" TO READ:

Agency - The City of Sunnyvale

Board - The City Council of the City of Sunnyvale

Engineer - The City Engineer of the City of Sunnyvale, or his/her duly authorized agent(s).

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UNDER **SUBSECTION 1-2**, INSERT THE FOLLOWING DEFINITION BETWEEN DEFINITIONS FOR STATE AND STORM DRAIN:

State Standard Specifications — The July 1992 edition of the Standard Specifications issued by the State of California, Department of Transportation (Caltrans).

Page 7

UNDER **SUBSECTION 1-4**, "UNITS OF MEASURE," DELETE SUBSECTION 1-4.1 "GENERAL," AND SUBSTITUTE WITH:

1-4.1 General. The U.S. Standard Measures (also called the U.S. Customary System) is the principal measurement system in these specifications, and shall be used for construction.

SECTION 2 — SCOPE AND CONTROL OF WORK

Page 13

REVISE ITEMS 11 AND 15 IN TABLE 2-5.3.2(A) TO READ:

Item	Subsection Number	Title	Subject
11	304-2.1.1	General	Metal Hand Railings
15	306-6	Remodeling Existing Sewer Facilities	Control of Sewage

Page 13

ADD THE FOLLOWING SUBSECTION 2-5.4 TO SECTION 2-5:

2-5.4 Record Drawings. The Contractor shall keep up-to-date a complete record set of prints of the Contract Drawings showing every change from the original drawings made during the course of construction including exact location, sizes, materials and equipment. A complete set of corrected and completed Record Drawing prints shall be submitted to the Engineer prior to final acceptance for review and approval by the Engineer.

SECTION 5 — UTILITIES

Page 21

REVISE THE REFERENCE TO "UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA" IN THE THIRD PARAGRAPH OF **SUBSECTION 5-1** TO READ "UNDERGROUND SERVICE ALERT."

SECTION 7 — RESPONSIBILITIES OF THE CONTRACTOR

Page 28

DELETE THE NEXT-TO-THE-LAST PARAGRAPH OF SUBSECTION **7-2.2** THAT READS:

Each worker shall be paid ....., Department of Industrial Relations.

Page 34

ADD THE FOLLOWING SUBSECTION:

7-10.4.5 Safety Vests. Safety vests are required to be worn by all personnel on all construction projects.

END OF PART 1

PART 2 — CONSTRUCTION MATERIALS

Part 2 — Construction Materials, shall consist of the Construction Materials of the "Greenbook" Standard Specifications for Public Works Construction, 2000 Edition, written and promulgated by Public Works Standards, Inc., as modified below.

SECTION 200 — ROCK MATERIALS

Page 50

ADD NEW SUBSECTION TO READ:

200-3 Cobblestone.

Cobblestones shall be smooth, rounded in shape, water-worn stone. The size of the stone shall not be less than four (4) and no larger than six (6) inches in diameter and shall have no fractured sides. The stone color shall be varying natural tones, ranging from medium-dark grays to light-medium brown tans. The contractor shall furnish samples of the rock for approval. Only rocks meeting approval shall be used.

Page 52

Table 201-1.1.2 (A)

To section title "Street Surface Improvement," add superscript "7" after title.

Page 53

ADD NEW FOOTNOTE TO TABLE 201-1.1.2(A) TO READ:

[7]For concrete used for curbs, gutters, sidewalk or driveway approaches, lampblack shall be added at the rate of 1 pint (powder) per cubic yard.

SECTION 201 — CONCRETE, MORTAR AND RELATED MATERIALS

Page 68

201-6.2.5 Fly Ash

ADD THE FOLLOWING SENTENCE:

The proportioning limits of fly ash (as a percentage of weight of cement) of Section 201-1.2.5 shall not apply.

Page 68

201-6.3.1 General

ADD THE FOLLOWING SENTENCE:

For CLSM used as trench pipe bedding and trench backfill, the minimum cement quantity shall be 47 pounds per cubic yard. The 28-day compressive strength shall be a minimum of 100 psi and a maximum of 200 psi.

SECTION 202 — MASONRY MATERIALS

Page 71

ADD NEW SUBSECTION TO READ:

202-3 Interlocking Pavers

Interlocking concrete pavers shall be manufactured in accordance with ASTM C936-82, and shall be in accordance with the patterns shown on the plans where designated. These products shall be as noted on the plans, or approved equal.

All pavers shall conform to the following specification:

Concrete shall have a minimum compressive strength of 8,000 psi in accordance with testing procedures ASTM C-140.

Materials used to manufacture Concrete Interlocking Pavers shall conform to the following:

Cement — ASTM C-150 (Portland Cement)

Aggregates — ASTM C-33 (washed, graded sand and rock)

Sand laying course shall be a concrete sand with 100% passing a No. 200 sieve size. Thickness of the sand laying course should be uniform to insure an even surface. The designed thickness should be a maximum of one (1) inch.

SECTION 203 — BITUMINOUS MATERIALS

Page 82

203-5.3 Composition and Grading

Add to Table 203-5.3 (A), 2% latex additive to Standard Type II Slurry Seal.

Page 82

DELETE SECTION 203-6 ASPHALT CONCRETE AND SUBSTITUTE WITH:

203-6.2 ASPHALT CONCRETE

Asphalt to be mixed with aggregate shall be Grade AR-4000.

Asphalt concrete shall conform to the State Standard Specifications, Section 39.

Base courses shall be ¾" maximum, medium. Surface courses and overlay shall be ½" maximum, medium.

SECTION 207 — PIPE

Page 120

INSERT BEFORE **207-1** THE FOLLOWING:

NOTE: Use vitrified clay pipe (extra strength) or SDR 35 PVC (green) for sanitary sewer mains, ductile iron pipe for water mains, and RCP Class IV for storm sewers. Sanitary sewer laterals shall be VCP (extra strength) , SDR 35 PVC (green), or ABS schedule 40. Storm drain laterals shall be RCP, or SDR 35 PVC (green).

207-9.2.1. DUCTILE IRON PIPE: GENERAL

ADD THE FOLLOWING:

Ductile iron pipe shall be thickness Class 52 or Pressure Class 350.

ADD NEW SUBSECTIONS AFTER SUBSECTION 207-9.2.1:

207-9.2.1.1 Fire Hydrants. Fire hydrants shall be of the wet barrel type and have one 4½" streamer outlet, one 2½" fire hose outlet, a 6" bury and a 6" gate valve. The makes and models of hydrants listed below are approved for use. For makes and models of hydrants not listed below, but which the Contractor believes are "equal," they shall be submitted for review, and be approved, in writing, before the hydrants are delivered to the job site. Fire hydrants shall be set to correct street grade and the 4½" streamer outlet shall face the street.

Approved Fire Hydrants: Clow 75 or approved equal.

207-9.2.1.2 Water Main — Ductile Iron Pipe.

Approved Appurtenances (Note 1):

Item	Make & Model	Note
Corporation Stop (Compression Coupling)	Mueller Model H-15008 (1") Mueller Model H-15013 (2")	2
Angle Meter Stop 1" and smaller (flared)	Mueller Model B-24258	2
Angle Meter Stop 1½" to 2" (flared)	Mueller Model B-24276	2
Tapping Sleeve CI, DI	Mueller Model H-615	3
Tapping Sleeve AC	Mueller Model H-619	3
Tapping Sleeve — C.C. Pipe Only	Custom made	
Tapping Valve — Corporation Stop 2"	Mueller Model H-15013	3
Tapping Valve — Gate Valve 4"-12"	Mueller Model A-2360-23 (tapping)	3
Gate Valve — Mechanical Joint	Mueller Model A-2360-23	3
Air Release Valve	APCO Model Comb. 143C - 1"; 145C - 2"; 147C - 3"; etc.	4
Blow-off	Kupferle TF 550	
Service Saddles	Mueller Model BR2B	5

Note 1: All gate valves shall be resilient seated and conform to AWWA Standard C509.
Note 2: Equivalent models manufactured by J.Jones, McDonald or Ford may be accepted if approved in writing by the City
Note 3: Equivalent models manufactured by Iowa, M&H or Smith Blair may be accepted if approved in writing by the City
Note 4: Equivalent models manufactured by Crispin, Clow or Valmatic may be accepted if approved in writing by the City
Note 5: Equivalent models manufactured by Smith Blair may be accepted if approved in writing by the City

SECTION 209 — ELECTRICAL COMPONENTS

Page 180

REVISE SUBSECTION 209-1 TO READ:

209-1 REGULATIONS AND CODES. All electrical equipment shall conform to the latest City of Sunnyvale adopted edition of the following standards: National Electrical Manufacturers Association (NEMA); the Underwriters' Laboratories, Inc. (UL); International Municipal Signal Association (IMSA); Standards of the American Society for Testing and Material (ASTM); American National Standards Institute (ANSI); the Insulated Power Cable Engineers Association (IPCEA); or the Electrical Industries Association (EIA), wherever applicable. Additionally, where applicable and referenced, electrical systems relating to traffic signalization systems, including appurtenant lighting systems shall be in conformance with the State Standard Specifications and State Standard Plans. In addition to any Referenced Requirements, the requirements of the Contract Specifications and Plans, these modifications and the Special Provisions, all materials and workmanship shall conform to the requirements of the National Electrical Code, as amended by the City of Sunnyvale, hereinafter referred to as the Code; Title 8 of Barclay's Official California Code of Regulations; Subchapter 5 of the Electrical Safety Code; CAL-OSHA Construction Safety Orders; and Rules for Overhead Electrical Line Construction, General Order No. 95 of the Public Utilities Commission.

Wire size shall be based on American Wire Gage (AWG) Standards.

These specifications apply to materials to be used in the construction or installation of street lighting systems, traffic signal systems and other electrical work. These specifications set forth the product, equipment, and fabrication of components as well as designation schedules of pole standards, conductors and cables.

Page 180

FOR SUBSECTION 209-2.1 ADD NEW SUBSECTIONS 209-2.1.1 THROUGH 209-2.1.8 TO READ:

209-2.1.1 Description. The electrolier standards shall be prestressed round tapered concrete poles manufactured under a properly controlled process to obtain optimum strength. Each pole shall consist of accurately placed high-tensile steel prestressing cables, a welded spirally wrapped wire cage for torsional reinforcement, dense, durable and high-strength centrifugally cast concrete, and surfaces treated to ensure uniform texture. The pole shall conform to the appropriate standards of the American Concrete Institute, AASHTO and UBC. Poles shall be type A, type B, or type C.

Type A poles shall be manufactured by Ameron (series 1-C2-25SV-A4, 6, or 8) or equal.

Type B poles shall be manufactured by Ameron (series 2-C2-25SV-A4, 6, or 8) or equal.

Type C poles shall be manufactured by Ameron (series 1-C3-30SV-E4, 6, or 8) or equal.

Aluminum luminaire arm shall be provided as a part of the electrolier standard. Refer to the Table of subsection 209-2.9 for sizes of arm, pole and luminaire.

Electrolier standards shall support the indicated loads and a 23 psi basic wind pressure with a 1.8 minimum on yield strength safety factor.

All poles and standards shall be provided with handholes. Handhole covers and access doors shall be secured with Allen-head screws or other tamper-resistant devices approved by the Engineer.

209-2.1.2 Cement. Portland cement used for construction of electrolier standards shall conform to the current specification for "Portland Cement," ASTM Designation C150, Type III.

209-2.1.3 Aggregates. Aggregates shall meet current requirements of ASTM Designation C33, except for grading requirements which may be altered to create the desired architectural effect.

209-2.1.4 Water. Water used in mixing concrete shall be clean and free from deleterious amounts of oil, acids, alkalis or organic materials.

209-2.1.5 Prestressing Strand. High-tensile prestressing strand shall conform to the current specifications for "Uncoated Seven-Wire Stress — Relieved Strand for Prestressed Concrete," ASTM Designation: A416, Grade 250.

209-2.1.6 Spun Concrete. Aggregate cement and water for concrete shall be batched by weighing or metering to assure correct proportions. Concrete shall be compacted in the mold to maximum density by centrifugation in a horizontal position.

209-2.1.7 Surface Treatment. All concrete poles shall be provided with blasted surface, uniform in lines and texture.

209-2.1.8 Finishes. All pole finishes shall be black and white aggregates. Poles shall be provided with a protective coating for preventive maintenance.

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REVISE SUBSECTION 209-2.2 TO READ:

209-2.2 Anchor Bolts. Anchor bolts shall be of the type and size shown on the Plans. Unless otherwise specified anchor bolts, anchor bars, studs and nuts shall conform to the provisions of ASTM Designation: A307. Where specified to be required high strength anchor bolts, bars, and studs shall conform to the provisions of ASTM Designation: A325 or A449 and shall comply with the mechanical requirements of ASTM Designation: A325 after galvanizing. Nuts and washers for high strength anchor bolts shall conform to ASTM Designation: A325.

Welding shall not be performed on any portion of the body of high strength anchor bolts. The minimum pitch diameter of the threaded portion of all anchor bolts shall conform to ANSI Standard: B1-1, having a Class 2A tolerance before galvanizing. After galvanizing, the pitch diameter of the nuts may be tapped over ANSI Standard: B1-1, Class 2B tolerance by the following maximum amounts:

$^{5}/_{8}$ inch - 1 inch ..... 0.023 inch oversize
1⅛ inch and larger ..... 0.033 inch oversize

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REVISE SUBSECTION 209-2.3 TO READ:

209-2.3 Conduit. Conduit to be used for electrical applications shall be as indicated on the plans and shall conform to UL Publication UL6 "Rigid Metallic Conduit" and UL Publication UL 651 "Rigid Non-Metallic Conduit" and the provisions as specified herein.

209-2.3.1 Rigid Metallic Conduit. Conduit and fittings to be installed in or on structures, or on the surface of poles shall be galvanized, rigid, mild steel.

Rigid conduit, threaded couplings and elbows to be installed underground shall be Polyvinyl-Chloride (PVC) externally coated galvanized rigid steel, Type A-40 conforming to the provisions of NEMA Standard Pub. No. RN 1. The PVC coating shall be 40 mils in thickness with a minimum tensile strength of 2000 psi and the adhesion shall be greater than the cohesive strength of the coating.

209-2.3.2 Rigid Non-Metallic Conduit. Rigid non-metallic conduit shall be rigid polyvinyl chloride Electrical Plastic Conduit (EPC) conforming to the provisions of NEMA Standard Pub. No. TC2, with fittings conforming to NEMA Standard Pub. No. TC3.

EPC schedule 40-PVC shall be used for underground installation. EPC schedule 80-PVC shall be used for heavy-duty applications above ground, such as riser conduit on wood poles above ten feet.

209-2.3.3 Conduit Markers. Conduit markers where required shall be embossed aluminum tape with ¼" high letters.

209-2.3.4 Expansion Fittings. Expansion deflection conduit fittings shall consist of a molded neoprene sleeve with a bonding jumper passing through a separate waterproof compartment and two silicon bronze couplings. Fittings shall permit a minimum of ¾ inch expansion and construction, and a ¾ inch deflection without deformation.

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REVISE SUBSECTION 209-2.4 TO READ:

209-2.4 Wire. Conductors shall consist of solid or stranded copper, of the gage size indicated in Conductor Table, Section 86, State Standard Specifications, as shown on the plans, or as specified in the Special Provision. Wire sizes shall be based on American Wire Gage (AWG).

Copper wire shall conform to the specifications of ASTM Designations: B3 and B8.

209-2.4.1 Traffic Signal and Multiple Lighting Conductors. Conductors for traffic signal, multiple lighting installations and all underground multiple or control circuits shall be UL listed and rated for 600-Volt operation. The insulation shall be NEC type THW vinyl chloride plastic insulation conforming to the specifications of ASTM Designation: D2220.

Overhead service drop and feeder conductors shall be AWG No. 6 minimum size, seven strand insulated aluminum wire with a No. 6 steel reinforced bare aluminum neutral, 1170 pound ultimate strength, conforming to the provisions of PG&E service requirement specification.

209-2.4.2 Conductor Identification. All single conductors and cables shall have clear, distinctive and permanent markings on the outer surface throughout the entire length showing the manufacturer's name or trademark, insulation type letter designation, conductor size, voltage rating and the number of conductors if a cable.

Unless otherwise specified, conductor insulation shall be of a solid color or of basic colors with a permanent colored stripe as indicated in the Conductor Table included under Section 86-2.08A of the State Standard Specifications. Identification stripes shall be continuous over the entire length of the conductor.

Small permanent identification bands shall be marked as detailed in Conductor Table and fabricated from embossed six mil, oil resistant polyvinyl chloride tape with pressure sensitive backing. Tape shall be of a type such that embossed symbols contrast with the background color. The bands shall be securely attached to conductors in pull boxes and near the end of each conductor where conductors are terminated. Where circuit and phase are clearly indicated by color of conductor insulation, bands need not be used.

Size of bands shall be proportional to size of conductors being marked.

Conductors within cabinets shall be neatly cabled together with self-clinching nylon cable ties, waxed lacing or other such method approved by the Engineer.

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ADD NEW SUBSECTIONS 209-2.5 THROUGH 209-2.11.1 TO READ:

209-2.5 Pull Boxes. Pull boxes, covers and extensions for installation in the ground or in sidewalk areas shall be of the sizes and details shown on the plans and shall be precast reinforced concrete, or plastic if approved by the Engineer. Plastic Material shall be self-extinguishing when tested in accordance with ASTM Designation: D 635, and shall show no appreciable change in physical properties with exposure to the weather.

Pull boxes and covers for installation in structures shall be of the sizes and details shown on the plans. In lieu of the structure pull box shown on the plans, the Contractor may use a telescoping steel pull box, with interior dimensions, conduit entrances, and cast iron cover conforming to the details shown on the plans. Design of the steel pull box shall be submitted to the Engineer for review prior to fabrication.

Covers shall be secured with ⅜ inch bolts, capscrews, or studs, and nuts shall be brass, stainless steel or other non-corroding material. Stainless steel hold-down bolts, capscrew or studs, nuts and washers shall have a chromium content of not less than 18 percent and a nickel content of not less than 8 percent. Nuts shall be recessed below surface of cover.

209-2.5.1 Cover Marking. Covers for pull boxes shall be marked as follows:

(a) "TRAFFIC SIGNAL" where pull box contains traffic signal conductors with or without street lighting conductors.
(b) "STREET LIGHTING" where pull box contains street lighting conductors only.
(c) "COMMUNICATION" for pull boxes where communication conduit enters the pull box.
(d) "SPRINKLER CONTROL" for pull boxes where sprinkler control conduit enters the pull box.
(e) "COUNT STATION" for pull boxes where traffic count station conduit enters the pull box.
(f) "SERVICE" for pull boxes where conduit from utility facilities terminate.

Marking letters shall be between one and three inches high.

Marking shall be clearly defined and uniform in depth and may be placed parallel to either the long or short sides of the cover.

Marking shall be applied to each steel or cast iron cover prior to galvanizing by one of the following methods:

a. Cast in the cover.

b. Cast iron strips, at least ¼" thick, with the letters raised a minimum of $^{1}/_{16}$ inch. Strips shall be fastened to covers with ¼" flathead stainless steel machine bolts and nuts. Bolts shall be peened after tightening.

c. Sheet steel strips, at least 22-gage with the letters raised a minimum of $^{1}/_{16}$ inch above the surrounding surface of the strips. Strips shall be fastened to covers by spot welding, tack welding, brazing, or with ¼ inch roundhead stainless steel machine bolts and nuts. Bolts shall be peened after tightening.

d. Bead welding the letters on the covers. The letters shall be raised at least $^{3}/_{32}$ inch.

209-2.6 Luminaires. All luminaires shall conform to ANSI performance standards and the provisions as specified herein. Refer to the table of subsection 209-2.9 for type of luminaires required for each application. The luminaire shall conform to the dimensions as shown on the standard plans.

The housing shall be die-cast aluminum and shall have a natural aluminum or aluminum colored epoxy finish. The latch shall have a protruding handle and shall be made so that the ring and refractor assembly can be easily opened and positively latched closed again with one hand wearing a heavy lineman's glove.

The refractor, reflector and socket shall be provided with a high-temperature felt or elastomer gasket to produce a dust-proof seal when the luminaire is latched shut. The refractor shall be securely hinged to the housing in such a manner that the lower assembly cannot accidentally become detached and fall when the luminaire is opened.

Gaskets shall be resilient enough to seal the optical assembly without strain on the matching parts and shall not deteriorate under normal operating conditions or produce deposits inside the optical chamber.

Luminaires shall be provided for slip-fitter end mounting on two inch mast arms and shall be designed for easy installation and leveling, and shall be strong enough to withstand any impact on the pole standard which is not great enough to knock the pole to the ground.

The refractor shall be capable of producing the light pattern and optical characteristics specified. The optical system shall produce the maximum usable light with minimum glare. Light distributions obtainable shall conform to IES standards.

Conductor insulations shall be a high temperature formulation suitable for use in street lighting luminaires.

All wiring connections shall be at terminals or made with quick-disconnect plugs that are polarized or keyed to prevent incorrect connections.

All luminaires shall have wiring diagrams, voltage ratings, lamp wattage and all other pertinent electrical data prominently and permanently displayed on a durable label in each luminaire. The label shall be conspicuous when the luminaire is open for servicing.

All parts shall be smooth and free of sharp edges. All mating parts shall fit together easily and without strain and wiring shall be neatly arranged.

No luminaire supplied under this specification shall have appearance incompatible with those already in use in Sunnyvale nor shall it have any feature making it impractical, unsafe or expensive to use.

All high pressure sodium luminaires shall have NEMA 15 Amp twistlock photocell receptacles which shall be wired for 120/240 Volt operation. A shorting cap shall be installed in the receptacle when a photocell is not required.

Each luminaire shall be provided with an internal ballast assembly (including ballast, capacitor and lamp starter unit) mounted on a down opening door. The door shall be hinged to the luminaire housing and secured separately from the refractor door, and shall be easily removable and replaceable. All connections from the ballast assembly shall be made with a single multi-circuit connector or individual color-coded NEMA tab connectors. Field connections to the luminaire shall terminate on a barrier type terminal block secured to the housing.

Glare shields are not required. Each luminaire shall be furnished without photoelectric unit receptacle unless otherwise indicated on the plans or in the Special Provisions.

209-2.7 Photoelectric Controls. Photoelectric controls shall be capable of switching multiple lighting systems directly.

209-2.7.1 Types. The types of photoelectric controls shall be as follows:

Type I photoelectric control shall consist of a photoelectric unit and a contactor in a single weatherproof housing.

Type II photoelectric control shall consist of a photoelectric unit in a weatherproof housing and a separate contactor located in a traffic signal controller cabinet.

Type III photoelectric control shall consist of a photoelectric unit and a separate contactor, each in a separate weatherproof housing.

Type IV photoelectric control shall consist of a photoelectric unit in a weatherproof housing which plugs into an EEI-NEMA twist lock receptacle integral with the luminaire.

A switch to permit manual operations of the lighting circuit shall be provided for Type I, Type II and Type III photoelectric control. Switches shall be of the single-hole-mounting toggle type, single-pole, single-throw, rated at 15 Amperes, 125 Volts. Switches shall be furnished with an indicating nameplate reading "Auto-Test" and shall be connected in parallel with the load contacts of the photoelectric unit.

209-2.7-2 Photoelectric Unit. The photoelectric unit shall provide an output in response to changing light levels. The response level shall remain stable throughout the life of the control unit. Components of the unit shall not require periodic replacement.

Units for street lighting shall have a "turn-on" between one and five foot-candles and a "turn-off" at between 1 1½ and 5 times "turn-on."

Units for illuminated signs shall have a "turn-on" level of between 20 and 30 foot-candles. (Turn-on level specified above corresponds to a switching level of approximately 40 to 60 foot-candles measured in the horizontal plane.) "Turn-off" level shall not exceed 3 times "turn-on" level.

Measurements shall be by the procedures set forth in EEI-NEMA Standards for Physical and Electrical Interchangeability of Light-Sensitive Control Devices Used in the Control of Roadway Lighting.

Photoelectric controls, except Type IV, shall be furnished with a 4-inch minimum inside diameter slipfitter containing a terminal block and with cable supports or clamps to support pole wires.

The photoelectric unit receptacles shall be the EEI-NEMA type. Mounting brackets shall be used where pole-top mounting is not possible. Photoelectric controls shall be installed at the locations shown on the plans and oriented north.

Photoelectric units shall be screened to prevent artificial light from causing cycling.

The photoelectric unit shall also conform to the following:

The supply voltage rating shall be 60 Hz, 120 Volts or 240 Volt as specified.

The load rating shall be 800 Watts minimum.

The operating temperature range shall be from minus 20_E F. to plus 150_E F.

The power consumption shall be less than 10 Watts.

The base of the unit shall be provided with a 3-prong, EEI-NEMA standard twist-lock plug mounting.

209-2.7.3 Lighting Contactors. Lighting contactors shall be rated 600 Volts, 60 Hertz industrial duty, or as designated on the plans. The contacts shall be rated to switch the actual connected load, but shall be not less than 30 Amps per pole nor less than the rating shown on the plans. Contactors shall be capable of making and breaking any load within the rating of the contactor without the assistance of auxiliary arcing contacts. Auxiliary arcing contacts are not acceptable and shall not be used in the work. All contacts must be removable without disturbing line or load wiring.

Contactors shall be electrically held. Unless otherwise shown on the plans, coils shall operate on both 208 or 240 Volts interchangeably, and shall be continuously rated and fully encapsulated.

209-2.7.4 Contactor and Test Switch Housing. For Type I control, the enclosure shall house the test switch only. For Type III control, the contactor and test switch shall be housed in a suitable NMA Type 3R enclosure. The enclosure shall be provided with a factory-applied rust resistant prime coat and baked enamel finish coat. Two coats of aluminum paint shall be applied. At the Contractor's option, the enclosure may be hot-dip galvanized in lieu of painting. A minimum of 2½ inches shall be provided between contactor terminals and end of enclosure for wiring connections. The enclosure shall be mounted on the same standard as the photoelectric unit at a height of approximately 6 feet above the base.

For Type II control, the test switch shall be housed in the traffic signal controller cabinet with the contactor.

209-2.7.5 Wiring. Conductors between the photoelectric unit and an external contactor shall be No. 14 AWG and shall be run inside the lighting standard, or in conduit, unless otherwise shown on the plans.

209-2.8 Ballasts. Unless shown on the plans, ballasts for high intensity discharge lamps shall be integral with the luminaire. Power factor shall be 0.9 or better. Ballasts shall be designed specifically to operate the specified lamp at the available supply voltage.

Ballast coils shall be heavily encapsulated in epoxy, electrical varnish or other suitable compounds to prevent ballast noise.

The lamp current wave-shape crest factor shall not exceed two at rated line voltage.

Ballast shall be magnetic regulator type and shall maintain wattage output within 2% of rated value, with 10% fluctuation of supply voltage.

After a warm-up period of fifteen minutes, input current and output Watts shall not vary more than 5% from the ballast rating when operated at the rated voltage with a lamp of the correct type and wattage.

Ballasts shall conform to the provisions in Section 86-6, "Lighting", of the State Standard Specifications and these specifications.

Suspension of ballasts by the handle and hanger method will not be required.

The ballast for each high pressure sodium lamp to be used in a mast arm mounted luminaire shall be of the regulator type and shall be mounted in the luminaire housing.

Each regulator type high pressure sodium lamp ballast shall operate at a minimum power factor of 98 percent and shall provide proper operation of its respective lamp within a range of +/- 10 percent of rated line voltage.

209-2.9 Lamps. High intensity discharge lamps for street lighting luminaires shall be of the power absorption (Watts) characteristics that are suitable for the type of luminaires as designated on

the plans.

The lamps shall meet or exceed the requirements as shown in the table below and shall operate at the design voltage shown on the Plans.

ELECTROLIER REQUIREMENTS

Street Width F.C. to F.C.	Luminaires	Spacing		Pole and Arm Details		
		Sidewalk	Median	Sidewalk		Median
				Center of Pole Foundation 3'-0 " or less from Face of Curb	Center of Pole Foundation Greater than 3'-0" from Face of Curb	
36'	70W HPS	120'-150' Staggered	N/A	25' pole (4' arm)	25' pole (8' arm)	N/A
40'	70W HPS	120'-150' Staggered	N/A	25' pole (4' arm)	25' pole (8' arm)	N/A
44'	70W HPS	120'-150' Staggered	N/A	25' pole (4' arm)	25' pole (8' arm)	N/A
64'	200W HPS	100'-120' Staggered	N/A	30' pole (6' arm)	30' pole (8' arm)	N/A
Over 64' without median	200W HPS	120' Opposite	N/A	30' pole (6' arm)	30' pole (8' arm)	N/A
Over 64' with median	200W HPS	N/A	120'	N/A	N/A	30' pole 8' double arms (also, see note)

Note: Electroliers installed in the median at a left turn pocket, shall have a 4' arm over the turn lane.

Class of Lamp	Watts	Avg. Initial Lumens	Mean Lumen Output	Avg. Rated Life (Hrs.)	Bulb	Lamp Designation
High Pres. Sodium	70	5800	5220	24000	E-17	LU 70
	200	22000	98000	24000	E-18	LU 200

209-2.10 Internally Illuminated Street Name Signs. The Contractor shall relocate or furnish and install the Internally Illuminated Street Name Signs as shown on the plans of the respective intersection signal plans. The Contractor shall supply and install the required or necessary mast arm collars, hangars, etc., as specified on ES-33 of the State Standard Plans. Any unused hardware shall be delivered to the City's Storage Yard, 121 San Lucar Court, Sunnyvale as salvage.

209-2.11 Controller Assembly Materials and Equipment As Applicable the general requirements of Section 86-3.01 "Controller Assembly" of the State Standard Specifications as well as the following requirements of this Subsection:

a. Controller Cabinet - Each controller cabinet shall have the following nominal exterior dimensions:

Model 332 cabinet - 67" high x 24" wide x 30" depth.

Model 333 cabinet (interchangeable with Type 'P' cabinet) - 54" high x 44" wide x 26" depth.

Model 336 cabinet (interchangeable with Type 'M' cabinet) - 35" high x 24" wide x 20" depth.

Model 337 cabinet (interchangeable with Type 'G' cabinet) - 35" high x 20" wide x 17" depth.

b. Controller Units - Section 86-3.11, "Model 170 Controller Assembly" of the State Standard Specification is amended to read: Model 170 controller assemblies shall consist of a Model 170 controller unit, a Real Time Split Monitor, a Hayes compatible 1200 baud modem, and all auxiliary equipment required to control the signal indications as shown on the plans, as specified in these Specifications and as 3.02, "Interval Sequence", and 86-3.03, "Flashing Operations" of the State Standard Specifications.

Controllers shall be mounted on the top most rack of the cabinet.

All equipment shall be permanently identified by means of engraved plastic labels. The area directly below the detector card rack shall have labels indicating detection assignments for the plug-in detectors.

The supplier of the traffic control equipment shall furnish engraved plastic labels to be installed on conductors in the bottom of the controller cabinet by the Contractor's field personnel. All controller assemblies, controller cabinets and associated hardware shall be inspected and evaluated for compliance with the following specifications:

All applicable provisions of Section 86 of the State Standard Specifications.
"National Electrical Manufacturers Association (NEMA)"
"Underwriter's Laboratories Inc. (UL)"
"Electronic Industries Association (EIA)"
"National Electrical Code (NEC)"
"American Society for Testing and Materials (ASTM)"
"American National Standards Institute (ANSI)"

The Real Time Split Monitor shall conform to the following specifications:

The program shall have the capacity to collect and retain the amount of time each phase is green during a signal cycle. The Real Time Split data for a total of 120 cycles can be accumulated during a monitor period. A new set of counters is implemented every cycle or whenever one of the counters reaches 255 seconds. To begin a monitor period, an operator needs to enable the Real Time Split Monitor by Time of Day Function E, bit 8. At the selected time on the selected day of week, the Split Monitor will begin recording data, if non-zero value has been entered into D-O-E. The real Time Split Data shall upload into Sunnyvale's IBM-compatible computer for analysis. The program shall record and transmit the following alarms to the central computer: Conflict Flash, Cabinet Flash, Manual Plan selection or loss of communication.

209-2.11.1 Warranty. The respective manufacturers of the traffic control equipment provided shall warrant, for a period of five (5) years from date of shipment, all traffic control equipment listed below to be free from defects in material or workmanship and to be of the kind and quality designated and specified on the contract plans and specifications. The equipment shall be capable of performing as specified for the same five (5) year period.

- Master Traffic Controllers
- Cal Trans Type 90 Solid State Traffic Controllers
- Cal Trans Model 170 Solid State Traffic Controllers
- Conflict Monitor Units
- Coordination Units
- Emergency Vehicle Preemption Equipment

SECTION 212 — LANDSCAPE AND IRRIGATION MATERIALS

Page 192

ADD THE FOLLOWING AT THE END OF **SUBSECTION 212-1.1.1**:

Topsoils shall meet the following additional requirements:

Analysis Report and Approval - Provide the Engineer with three (3) copies of horticultural and structural soils analysis report on all proposed import topsoil. Field testing of imported topsoil shall be performed by an independent soil testing laboratory, selected and paid for by the City. The selection of the soil testing laboratory shall not be subject to the approval of Contractor.

Page 194

ADD THE FOLLOWING AT THE END OF **SUBSECTION 212-1.2.5**:

Wood chips shall be clean green softwood sized ½" x ½" to ½" x 3" by ⅛" to ½" thickness.

Page 194

ADD A NEW SUBSECTION 212-1.2.6 TO READ:

212-1.2.6 Soil Conditioners and Nitrified Sawdust. Wood sawdust or shavings shall be Redwood or mixed Redwood and hardwoods, 5% nitrogen, free of soil, rocks, bark strips, wood blocks or other foreign matter. Sample and lab analysis must be submitted for approval before delivery to site.

Controlled Release Fertilizer Tablets: 20-10-5 Agriform planting tablets, 21 gram tablet.

All fertilizers and soil conditioners shall be first quality, standard brand, agricultural products.

212-1.2.6.1 Materials Delivery and Storage. Manufactured materials shall be delivered in original containers with brand and maker's name marked thereon. Material in broken containers or showing evidence of damage will be rejected and must be immediately removed from the site. Odorous materials shall not be brought to the site until they are to be used.

212-1.2.6.2 Certificates. Contractor shall furnish a certificate or delivery slip to the Engineer with each delivery of material, in containers or in bulk. Certificate shall state source, quantity or weight, type and analysis, and date of delivery.

Page 194

ADD NEW SUBSECTIONS 212-1.4.1.1 THROUGH 212-1.4.1.5 TO SUBSECTION 212-1.4.1 THAT READ:

212-1.4.1.1 Contract Growing. All shrubs and trees shall be contract grown by a certified nursery approved by the Engineer. Submit proof of purchase of materials to the Engineer no later than thirty (30) calendar days after Notice to Proceed under the Contract. In the event that substitution of plant materials is allowed, the Contractor shall furnish plants of the next larger size than specified.

212-1.4.1.2 Tagging. All plants shall be true to name, and one of each bundle or lot shall be tagged with the name and size of the plant, in accordance with the standards of practice recommended by the American Association of Nurserymen.

212-1.4.1.3 Dimensions. Specimen plant materials are specified by height and spread. The first figure following the name of the plant is the height and the second figure is the spread. All measurements shall be made with material in an normal position without support of the branches. Plants specified by container size only shall be equal in size to similar plants in local retail nurseries.

DIMENSION EXAMPLE:

15 gallon broadleaf evergreens, 8-9 x 2-3 feet
15 gallon deciduous trees, 9-10 x 2-3 feet

212-1.4.1.4 Inspection Procedures. Right of inspection for approval or rejection is reserved at the place of growth or on the project site at any time upon delivery or during the work. Plants shall be inspected for size, variety, condition, defects or injury. Notify the Engineer of source of material no later than thirty (30) days after Notice to Proceed under the Contract. Provide transportation for the Engineer to place of growth for inspection of plants. Rejected material shall be promptly removed from the site.

212-1.4.1.5 Substitutions. Substitutions will be allowed only when specified material is proven unavailable and only with approval of the Engineer. Proposals will be considered for use of nearest equivalent size and variety with equitable adjustment to the contract price.

Page 196

REVISE SUBSECTION 212-2.1.4 TO READ:

212-2.1.4 Plastic Pipe For Use With Rubber Ring Gaskets.
Lateral line irrigation pipe shall be Class 200 NSSF 1120-1220 polyvinyl chloride (PVC) of the size indicated on the plans.

Mainline pipe shall be Schedule 40 up to 2" diameter and Class 315 for 2" and above diameter NSSF 1120-1220 polyvinyl chloride (PVC) of the size indicated on the plans.

All fittings for lateral or main line piping shall be Schedule 40 polyvinyl chloride (PVC) up to 2" and Class 315 for 2" Andover, or as specified on plans.

PVC Schedule 80 nipples shall be used with molded threads. Machine threaded nipples will not be allowed.

Solvent weld joints shall be of make and type approved by the manufacturer(s) of pipe and fitting. Solvent cement shall be at proper consistency throughout use. Mixing thinner with solvent will not be allowed.

Teflon tape shall be designed specifically for use on threaded connections in water carrying pipes.

Page 196

ADD NEW **SUBSECTION 212-2.1.6** TO READ:

212-2.1.6 Dissimilar Metals
Where pipe of dissimilar metals are connected, dielectric fittings shall be provided.

Page 197

REVISE **SUBSECTION 212-2.2.7** TO READ:

212-2.2.7 Valve Boxes. Valve boxes shall be heavy duty plastic with locking lids labeled "Irrigation", except as noted on the plans. Valve boxes shall be sized as required for easy access to equipment, one valve per box, and shall be manufactured by Ametaek, Brooks, Carson, or equal. In addition to ID tags on solenoid wires, as noted on the plans, stencil numbers on tops of box lids.

Page 197

ADD THE FOLLOWING AT THE END OF **SUBSECTION 212-2.3**:

Backflow prevention devices shall be as indicated on the plans. All exposed galvanized steel shall be painted with one coat of primer and two coats of gray-green rust inhibiting paint.

Page 197

ADD THE FOLLOWING AT THE END OF **SUBSECTION 212-3.2.2**:

Common, control and extra wires shall be solid copper, UL approved for direct burial installation, minimum gauge No. 14-1 AWG TYPE UF. Common wire shall be white, control wire shall be minimum No. 14-1 AWG-UF (red) and extra wires shall be minimum No. 14 AWG-UF (black).

Page 197

ADD NEW **SUBSECTION 212-3.2.3** TO READ:

212-3.2.3 Splicing Materials. Splicing materials shall be Scotchlock No. 3576, Rainbird Pentile Connectors, Aqua Splice Heat Shrink Splice, or equal.

Page 197

ADD THE FOLLOWING AT THE END OF **SUBSECTION 212-3.3**:

Irrigation controllers shall be as specified and as indicated on the plans. Controllers shall have a 120 V, 10 Ampere disconnect switch mounted and accessible inside the controller enclosure. The irrigation controllers shall be serviced with 120 V, No. 12, Type T.W. electrical wiring in rigid galvanized steel conduit and shall extend from the power source to the controller via the disconnect switch.

Keys for all locks shall be compatible with installed equipment. Supply owner with two (2) keys for each controller enclosure. At the time the controllers are delivered for testing, a complete schematic wiring diagram, including any wiring modifications, for each controller shall be submitted to the Engineer for approval. Prior to completion of the Contract, four (4) copies of each approved wiring diagram shall be furnished to the Engineer.

END OF PART 2

PART 3 — CONSTRUCTION METHODS

Part 3 — Construction Methods, shall consist of the Construction Methods of the "Greenbook" Standard Specifications for Public Works Construction, 2000 Edition, written and promulgated by Public Works Standards, Inc., as modified below.

SECTION 300 — EARTHWORK

Page 226

REVISE LAST LINE OF THIRD PARAGRAPH OF **SECTION 300-11.3.2** TO READ:

Penetration is that shown in Table 300-11.3.1.

SECTION 302 — ROADWAY SURFACING

Page 247

REVISE THE FOURTH PARAGRAPH OF **SUBSECTION 302-5.5** TO READ:

Asphalt concrete shall not be placed when the atmospheric temperature is below 10◦C (50◦F) and falling or during unsuitable weather.

Page 248

ADD THE FOLLOWING AT END OF **SECTION 302-5.5**:

The procedure whereby material is deposited in a windrow, then picked up and placed in the asphalt paver with loading equipment, will be permitted provided the asphalt paver is of such design that the material will fall into a hopper which has a movable bottom conveyor to feed the screed, and the loading equipment is constructed so that substantially all of the material deposited on the roadbed is picked up and deposited in the paving machine.

No portion of the weight of hauling or loading equipment, other than the connection, shall be supported by the asphalt paver, and no vibrations or other motions of the loader, which could have a detrimental effect on the riding quality of the completed pavement, shall be transmitted to the paver.

When asphalt concrete is placed directly upon asphalt treated permeable base, the asphalt

concrete shall be placed using a paver equipped with tracks unless the layer being placed is 0.15-foot or less in compacted thickness.

SECTION 303 — CONCRETE AND MASONRY CONSTRUCTION

Page 289

ADD NEW **SUBSECTION 303-4.3** TO READ:

303-4.3 COBBLESTONE PAVING.

303-4.3.1 General. Cobblestones shall be laid on a four (4) inch mortar bed. Mortar shall conform to Section 201-5.1 Class D. Mortar shall be tinted with Conrad Sovig Company LAB-X2874-4G (4lb/sack of cement), or approved equal.

303-4.3.2 Installation. Prior to installation, screed and float area to ¾" below final grade to allow for displacement, and wet the stones. While mortar bed is still moist, the cobblestones shall be hand-set within the concrete mortar bed so that $^1/_3$ or ½ of the stone's thickness becomes embedded. The stones shall be placed tight together so that a minimum of concrete mortar is exposed between the stones. Each stone shall be positioned to expose the rounded, smooth, aestethically best-appearing side of the stone. Care shall be exercised in achieving a uniform, aesthetically pleasing appearance to the overall surface of the cobble paving. All cobblestone shall be washed clean and free of any excess concrete mortar.

Initially, a 50 square foot section will be installed and approved, and shall serve as a standard of quality for the remaining areas of cobblestone paving.

303-4.3.3. Measurement and Payment. Cobblestone paving shall be paid for at the contract unit price as shown in the bid schedule. The Contract unit price for cobblestone paving shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, including excavation, subgrade preparation, formwork, aggregate base, mortar bed and hand placement of stones.

Page 289

ADD NEW **SUBSECTION 303-4.4** TO READ:

303-4.4 INTERLOCKING PAVERS

303-4.4.1 Construction. Cutting of pavers can be done with either a double bladed breaker or a masonry saw. However, when cutting is required in roadways or precision-designed areas, a masonry saw is recommended.

Pavers shall be clean and free of foreign materials before installation. Installation shall start from a corner or straight edge and proceed forward over the undisturbed sand laying course. Paving work shall be plumb, level, and true to line and grade, and shall be installed properly to coincide and align with adjacent work and elevations. All edges must be retained to secure the perimeter stones and sand laying course. Pavers shall be installed hand-tight and level on the undisturbed sand course. String lines shall be used to hold pattern lines true.

Concrete sand shall be spread over the installed pavers and vibrated into the joints between the stones. A roller vibrator or plate vibrator shall be used to compact the stones and to vibrate the sand into the joints between the stones. Excess sand shall be swept into the joints or disposed of from the surface area. The completed pavers installation shall be washed down and cleaned to provide a clean, finished workman-like installation.

303-4.4.1 Measurement and Payment. The contract unit price paid per square foot of concrete interlocking pavers shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing such work, including subgrade preparation and processed miscellaneous base, as called for on the plans or in the technical specifications, and as directed by the City and no additional compensation will be allowed therefore.

Page 293

ADD THE FOLLOWING AT END OF **SUBSECTION 303-5.5.3**:

Replace existing curb markings and paint after installation of curb and gutter.

SECTION 306 — UNDERGROUND CONDUIT CONSTRUCTION

Page 320

ADD NEW SUBSECTIONS BEFORE SUBSECTION 306-1:

306-0.1 Water Services.

A. Water Service Saddle and Tapping Sleeve Requirements
Service saddle or tapping sleeves are required as tabulated below:

The minimum size of service of residential and duplex is 1"; for industrial it is 2".

TYPE OF PIPE (new or existing)					
Diameter of Street Water Main (in.)	Cast Iron or Ductile Iron Pipe			Asbestos Cement (A.C.) (EXISTING ONLY)	American Concrete Cylinder Pipe (A.C.C.P.)
	Service Size			Service Size	Service Size
	1"	2"	4"+	All	All
4" through 30"	Direct tap allowed.	Service saddle required (Note 1).	(See Note 2.)	Service saddles required on all 1" and 2" taps (see Note 3 below). For services 4" and over, see Note 2 below.	Service saddles required on all 1" and 2" taps (see Note 4).

Note 1: Cast Iron or Ductile Iron Pipe — Saddles shall be double strap bronze - cc thread (Mueller BR2B, or approved equal).

Note 2: Tapping Sleeve and Tapping Valve — All 4 inch and larger services on C.I. or D.I. pipe requires Mueller A2360-23 valves and Mueller H-615 (D.I.) sleeves, or approved equals. The tapping sleeve shall be the same size as the service.

Note 3: A.C. Pipe — Saddles shall be double strap bronze - cc thread (Mueller BR2B or approved equal).

Note 4: A.C.C.P. Pipe — All 4" and larger services on A.C.C.P. shall use a Mueller H-619 sleeve or approved equal. The method of installation of a service saddle shall be in accordance with manufacturer's recommendations subject to approval by the City.

B. Marking Valve Locations

The location of all valves in the street shall be marked on the nearest curb with an incised "W" on the top of the curb and the distance in feet marked with incised roman numerals on the face of the curb, all in 2" high characters.

C. Taps

All wet (or live) taps made to existing water mains 12" and smaller shall be performed by the City. Taps made to A.C., D.I.P., or C.I.P. water mains larger than 12" shall be done by a qualified contractor, approved by City. The City does not perform live taps to A.C.C.P. 4" or larger.

All taps require a minimum of 48 hours advance notification of City . The Contractor

and/or owner shall be responsible for the complete installation of the service saddle or tapping sleeve and valve.

D. Water Shut-Down Notification

It is the contractor's responsibility to notify affected residents and businesses 48 hours prior to the start of a water main shut-down. The water main shut-down will be completed by City crews only.

E. Fire and Domestic Water Service and Water Service Location

Fire and domestic water services:

<table>
<tr><td rowspan="2">Fire Service Size (in.)</td><td colspan="7">Domestic Water Service Size (in.)</td></tr>
<tr><td>1</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td></tr>
<tr><td>4</td><td colspan="2" rowspan="5">See Note 1 Below</td><td colspan="5">See Note 2 Below</td></tr>
<tr><td>6</td><td colspan="4" rowspan="4"></td></tr>
<tr><td>8</td></tr>
<tr><td>10</td><td colspan="3" rowspan="2"></td></tr>
<tr><td>12</td></tr>
</table>

Notes:

1. Domestic and Fire services shall be separately tapped into the street water main and individual water services extended therefrom to the water meter or detector check locations.

2. Domestic and Fire services may be combined if approved by the Director of Public Works. If such a combined service is approved, the common water service shall extend from the water main in the street to the MFM/MVR flow meter.

Water Service Location:

The location of the detector check and/or the water meter shall be at the back of sidewalk or back of curb within the public right-of-way where possible, and will require approval.

F. Backflow Prevention Devices

Backflow Prevention Devices shall be installed in compliance with the "City of Sunnyvale Water System Cross Connection Control Program Policies and Regulations". A backflow prevention assembly shall consist of 2 check valves and a pressure relief valve connected in series with 2 non-rising stem gate valves. Backflow prevention assemblies shall be the same size as the pipe main in which they are installed. The assembly shall be UL listed and approved by the Research Foundation for Cross Connection Control, University of Southern California.

G. Meter and Meter Box Installation

The meter and meter box shall be furnished and installed by the City upon acceptance of the lateral service line, and the property owner has assumed responsibility for the connection on the discharge side of the meter. A backflow prevention device is required for all services 2" and larger. If deemed necessary by the City, a backflow prevention device may be required for smaller services. No meter shall be installed prior to full compliance with the cross connection control program.

H. Warranty Period

Installation of Water Services: The Contractor is responsible for maintenance and repairs to the service trench and pavement for a one-year warranty period after acceptance of the work by the City. One year after acceptance, the City will make a final inspection. If repairs have to be made, the contractor or developer will be notified to make repairs.

Page 338

DELETE SUBSECTION 306-1.4.1(6) AND SUBSTITUTE WITH:

6) Water Pipelines — Water pressure test: Pipe specified by pressure classification, 50 psi over the pressure classification, with a maximum of 200 psi. Other types of pipe, 120 percent of maximum operating pressure. The test pressure shall be measured at the highest point on the line unless specifically noted otherwise.

Page 341

ADD NEW SUBSECTION AFTER SUBSECTION 306-1.4.6:

306-1.4.7 Disinfecting Mains

New mains shall be sterilized, tested, and shall pass bacteria and other water quality requirements before being put into services. The Contractor shall supply all materials, labor and equipment required to disinfect the mains. The disinfectant shall remain in contact with the water

for a minimum of 24 hours before flushing. Bacteriological testing shall be conducted no less than 24 hours after flushing. Disinfection will be witnessed by the Engineer.

Chlorine tablets (e.g. HTH) shall be fastened to the top of the pipe with tar or permatex #2 according to the following schedule:

Length of Run (feet)	Number of Tablets for Pipe Line or Main Diameter of:					
	2"	4"	6"	8"	10"	12"
13	1	1	1	2	3	3
18	1	1	2	2	3	5
20	1	1	2	3	4	5
30	1	1	2	4	5	7
40	1	2	3	5	7	10

SECTION 307 — STREET LIGHTING AND TRAFFIC SIGNALS

Page 367

REVISE SUBSECTION 307-1.3 TO READ:

307-1.3 Equipment List and Drawings. The Contractor shall, within ten days of the Notice to Proceed, submit to the Engineer for review and approval, a list of equipment and material which he proposes to install. The list shall be complete as to name of manufacturer, size and identifying number of each item. The list shall be supplemented by such other data as may be required, including detailed scale drawings and wiring diagrams of any special equipment, and any proposed minor deviation from the plans. All of the above data shall be submitted in duplicate for approval. Following approval, any correction or modifications shall be made, and not less than six complete sets shall be resubmitted to the Engineer. The City will not be liable for any material purchased, labor performed, or delay to the work prior to such approval. Where the electrical work is to be constructed as detailed on the plans, the submission of detailed drawings and diagrams will not be required.

If ordered by the Engineer, the Contractor shall submit for approval, sample articles of the material proposed for use. After approval, said sample articles will be returned.

The intent of the plans and drawings is to show the approximate locations for signals, beacons, standards, lighting fixtures, signs, controls, conduits, services and appurtenances; the location of such may be changed in the field by the Engineer.

Page 368

ADD THE FOLLOWING TO THE END OF **SUBSECTION 307-1.5**:

Where facilities are to remain in operation for public use, existing electrical systems (signal, lighting, or other systems) or approved temporary replacements thereof, shall be kept in effective operation for the benefit of the public during the progress of the work, except when shutdown is permitted to allow for alterations or final removal of the systems. Traffic signal shutdowns shall be limited to periods during normal working hours, or those hours specified in the Special Provisions or to those hours designated by the Engineer. Street lighting system shutdown shall not interfere with the regular lighting schedule, unless otherwise permitted by the Engineer.

Where a facility requires continuous electrical power, the shutdown time for cut over shall be limited to one-half hour as scheduled by the Engineer, unless shown otherwise on the plans.

The Contractor shall notify the Engineer 24 hours prior to performing any work on existing systems. The Public Safety Department shall be notified 24 hours prior to any operation shutdown of a traffic signal system.

Page 368

ADD THE FOLLOWING NEW SUBSECTIONS 307-1.6 THROUGH 307-1.9:

307-1.6 Schedule of Work.

307-1.6.1 Utility Company Notification. Twenty-four hour notice shall be given to Pacific Bell, Pacific Gas and Electric Company, and the City of Sunnyvale, Department of Public Works, before the beginning of any operation involving their facilities or systems.

307-1.6.2 Systems Integration. Work shall be so scheduled that each traffic signal system, safety lighting system or other electrical installation shall be completed and ready for operation prior to integrating into the system and to the opening to traffic of the corresponding sections of the roadway.

If street lighting exists or is being installed in conjunction with the traffic signals, traffic signal systems shall not be placed in operation for use by public traffic without the energizing of street lighting at the intersection to be controlled.

Traffic signal system shall not be placed in operation, including flashing operation, until the roadways to be controlled are opened to public traffic, unless otherwise directed by the Engineer.

The initial turn-on shall be made between 9:00 a.m. and 2:00 p.m. unless specified otherwise in the Special Provisions. The Contractor shall schedule the turn-on with the Engineer at least one week in advance of the proposed date of turn-on. The Contractor shall insure that a qualified representative of the manufacturer of the control equipment is present and available for assistance on site on the date of the turn-on. Prior to turn-on, all equipment and appurtenant facilities as

shown on the plans shall be installed and operable. This includes pedestrian signals, pedestrian push buttons, vehicle detectors, interconnect systems, and lighting. All louvers, hoods and signal heads shall be directed to provide maximum visibility.

Turn-on of new or modified traffic signal systems shall be made only after all traffic signal circuits have been thoroughly tested as specified under Subsection 307-1.8.

For vehicular undercrossings, soffit lights shall be placed in operation as soon as practicable after falsework has been removed from the structure. Lightings for pedestrian structures shall be placed in operation prior to opening the structures to pedestrian traffic.

307-1.7 Inspection.

307-1.7.1 Installation of Systems. Prior to backfilling of conduit trenches or the pouring of concrete foundations, the Contractor shall notify the Department of Public Works and request inspection of all conduits and foundation forms. All conduits, conduit couplings, bends, ground bushings shall be tightened and all anchor rods, bolts, and ground rods shall be in place in the foundation form prior to request for inspection. Wire shall not be pulled in conduits until inspection and backfilling and pouring of foundations are completed. Stub ends of all conduits shall have approved caps and ground bushings installed prior to backfilling or pouring of foundations.

The contractor shall not backfill, enclose or otherwise cover up any electrical work prior to inspection and/or testing. Should any of the work be backfilled, enclosed or covered up, the Contractor shall, at his expense, expose such work for inspection and/or testing.

307-1.7.2 Correction of Faults and Damages. The Contractor shall guarantee the work against defects and shall, upon notification by the City of Sunnyvale, immediately correct any fault or damage caused by overloading, over-voltage, lack of fuse protection, use of incorrect or defective material, or defects of workmanship. Corrections shall be effected either by repair or replacement in a manner approved by the Engineer.

When existing facilities are damaged by the Contractor's operation during construction and said damage is not evident at the time of acceptance, the Contractor shall, when notified by the Engineer, repair or correct damage promptly in accordance with these specifications. Should the Contractor fail to correct the discrepancies within 24 hours after notification or such other time indicated by the City; or if the public safety requires emergency repairs, the City shall perform the necessary work and the Contractor will be charged for all associated costs. Said charges will be deducted from any money's due, or to become due the Contractor.

307-1.8 Compliance Tests.

307-1.8.1 Field Tests. Prior to completion of the work, the Contractor shall cause the following tests to be made on traffic signal installations, lighting circuit installations, and such other electrical installation work as the Engineer may direct. All tests shall be made in the presence of the Engineer.

1. Continuity Test. Each circuit shall be tested for continuity.

2. Ground Test Each circuit shall be tested for grounds.

3. Insulation Resistance Test. Insulation resistance test shall be made on each circuit using a megohmmeter insulation tester (Megger). The tests shall be at 500-Volts DC between the circuit and a ground. The insulation resistance shall not be less than 10 megOhms on all circuits, except for inductive loop detector circuits which shall have an insulation resistance value of not less than 100 megOhms.

4. Functional Test. A functional test shall be made in which it is demonstrated that each and every part of the system functions as specified.

The functional test for each new or modified system shall consist of not less than five days of continuous satisfactory operation. If unsatisfactory performance of the system develops, the conditions shall be corrected and the test shall be repeated until the five days of continuous satisfactory operation is obtained.

During the five-day test period, City of Sunnyvale forces will maintain the system or systems. The cost of any extraordinary necessary maintenance, except electrical energy and maintenance due to damage by the public, shall be at the Contractor's expense.

The functional tests shall not start on a Friday or on the day preceding a legal holiday.

Shutdown caused by factors beyond the Contractor's control shall not constitute discontinuity of the functional tests.

307-1.8.2 Faulty Material. Any fault in any material or in any part of the installation revealed by these tests shall be replaced or repaired by the Contractor at his expense in a manner approved by the Engineer, and the same test shall be repeated until no fault appears.

307-1.9 Safety Precautions.

307-1.9.1 Safety Orders. The Contractor shall adhere to all industry, utility company and California safety regulations for working on, and around power and telephone poles and underground vaults.

The operation, erection, or handling of tools, machinery, equipment, apparatus, materials, or supplies or any part thereof within 10 feet of any high-voltage line between 750 Volts and 50,000 Volts is prohibited. Higher voltages require greater clearances as specified in Article 86, Table X of "High-voltage Electrical Safety Orders", Title 8 of Barclay's Official California Code of Regulations, Subchapter 5 Electrical Safety Orders.

Prior to commencing any work where overhead high-voltage lines are involved, the procedure as specified herein shall be rigidly adhered to.

If the clearance from the top of improvement to be installed to the lines is in excess of 15 feet, no restrictions will be imposed; however, if the clearance required is within 5 feet of the 10 foot prohibited zone then the following requirements shall be followed:

1). A snubbing device shall be installed on the crane or other lifting or erecting device. The snubbing device shall be attached and adjusted so that the boom when fully raised or extended shall be outside of the 10 foot prohibited zone.

2) The electrolier standard shall be laid with the top pointing toward the base and the sling so fastened to the standard so that no part will be above the boom when fully erected. the electrolier shall be raised by taking in the cable, with the boom fully extended as snubbed and stationary.

Failure to comply with existing safety regulations of Cal OSHA, Pacific Bell, or the Pacific Gas and Electric Co. shall constitute non compliance.

307-1.9.2 Safety Clearance. All cuts and splices in existing City maintained systems shall be as approved by the City. Before starting work on any existing series circuit, the Contractor shall obtain a daily written safety circuit clearance from the Engineer. Cut-out plugs must be pulled, shorting and grounding devices in place, and "Men at Work" signs posted at cut-out switches, switch boxes and shorting stations before any work is done on a series circuit. The circuit will be re-energized only on the request of the same individual who obtained the safety clearance. The series circuit shall be in operating condition and re-energizing request made before 3:00 p.m. of each day the circuit is opened. Pacific Gas and Electric Company safety regulations, in addition to other pertinent safety regulations, shall be observed when working on series circuits.

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 307-2.6**:

Conductors may be joined by means of approved type spring pressure connectors or other methods permitted by the Engineer. Splices with or without connectors shall be soldered by the pouring or dipping method, except that soldering of pressure connectors and terminals may be omitted provided the connectors and terminals are applied with the proper type tool as recommended by the manufacturer of the connector or terminal being applied. Finished connections and terminals shall comply with and meet all UL requirements.

All stranded conductors smaller than No. 14 AWG shall be terminated in crimp type terminal lugs.

Unless specified otherwise or permitted by the Engineer, splices will be permitted only in the following types of circuits at the following locations:

1. Branch signal light neutrals in pull boxes.
2. Pedestrian push button circuits in pull boxes.
3. Multiple lighting conductors in bases of standards or in pull boxes.
4. In modified traffic signal systems where shown on the plans.

In lieu of the 600-Volt splice and splice insulation shown on the Plans, the Contractor may elect to use, with approval of the Engineer, a pin and receptacle locking type connector with waterproof housing capable of being disconnected without damage. The pin and receptacle shall be of a size to provide not less than 90 percent ampacity of the conductor being spliced. The pin and receptacle shall be applied to the conductors using a tool as recommended by the connector manufacturer and soldering will not be required.

Also, in lieu of the 600-Volt splice and splice insulation shown the plans, the Contractor may elect to use an epoxy insulated spring connector applied as follows:

The ends of the wires shall be joined together with an insulated spring type connector without soldering.

A 2-component, self-curing, epoxy resin shall be furnished in a double compartment, plastic envelope. The splice insulation shall be made by thoroughly mixing the two components in the envelope and, after cutting open one end of the envelope, inserting the wire connection into the epoxy resin and then taping the open end of the envelope.

Other methods may be used to mix and apply epoxy resin. Sufficient epoxy resin shall be provided to completely cover the connector and exposed bare wires at connector. The epoxy container shall be transparent to allow inspection.

Conductors in controller cabinets shall not be spliced.

Splice insulation shall conform to the details shown on the plans.

Low-voltage tape shall be UL approved and shall be either of the following types at the option of the Contractor:

(1) Self-fusing, oil and flame-resistant, synthetic rubber.
(2) Pressure-sensitive, adhesive, polyvinyl chloride, 0.007 inch minimum thickness.

Where polyvinyl chloride tape is used for a final layer, an electrical insulating coating shall be used which shall be fast drying, resistant to oil, acids, alkalis and corrosive atmospheric conditions and compatible with the tape.

On 600-Volt conductor splices, the Contractor, at his option, may use a cast insulation of self-curing epoxy resin which is compatible with wire insulation to form a moisture resistant joint. The resin shall be resistant to weather, and aromatic and straight chain solvents and, in addition, shall not sustain combustion. The resin shall be poured into molds of dimensions suitable for the splice.

On 600-Volt circuits, the Contractor, at his option, may elect to use either of the following splice insulation methods:

(1) A minimum of two thicknesses of electrical insulating pad, composed of a laminate of 0.085-inch thickness of electrical grade polyvinyl chloride and a 0.125 inch thickness of butyl

splicing compound with removable liner. Pads shall be applied to the splice in accordance with the manufacturer's recommendations. The ends of the applied pad shall be wrapped with polyvinyl chloride tape half lapped over the conductor insulation.

(2) Heat shrinkable insulating tubing shall be applied after completing the splicing procedure shown on the plans. Insulation over the connector shall consist of a heat shrinkable, mastic lined, heavy wall polyolefin cable sleeve, or cover, to which heat shall be applied at a temperature greater than 120E C. until the sleeve, or cover, shrinks and covers the connector and the mastic material has flowed completely around the cable to form a waterproof insulation.

Fused splice connectors shall be designed to provide a means of installing a $^{13}/_{32}$" x 1½" type ferrule fuse in the line.

The connector shall be waterproof and weatherproof, and have no exposed metal parts. Contact between the fuse and the holder shall be made positive by spring pressure; however, springs shall not carry current. When the connector is disassembled, the fuse shall go with the load end and will not remain connected to the line end. The terminals shall be crimp-sleeves or other approved type connectors.

On circuits having two ungrounded conductors, connectors shall be designed so that both conductors must disconnect simultaneously, that is, one conductor cannot be left energized while the other has been disconnected.

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 307-2.7**

Bonding and grounding conductors shall be copper wire or copper braid of the same cross sectional area as AWG No. 6 for series lighting systems and AWG No. 8 for all other systems.

The grounding electrode conductor shall be AWG No. 8 or the size specified in article 250-95 of the Code, whichever is larger. Where exposed to physical damage, minimum grounding electrode conductor size shall be AWG No. 4.

Grounding electrodes shall be $^{5}/_{8}$" x 10' copper-clad rods or ¾" x 10' galvanized steel rods. The resistance to ground from the grounding electrode shall not exceed 5 Ohms. The Engineer may order the use of other available electrodes to reduce ground resistance to less than 5 Ohms.

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ADD THE FOLLOWING AT THE END OF THE **SUBSECTION 307-2.8**:

All circuits except overhead fed electroliers shall be provided with services which include a disconnecting means, circuit protection, and service ground suitable for use as service equipment

under the prevailing conditions.

Services shall include the service entrance conductors, service drops or service laterals, service conductors, cabinets, service equipment, street lighting contactors, and other materials as required for a complete working system.

Electric service materials, devices and equipment shall conform to the plans, these specifications, Pacific Gas and Electric Co. "Electric and Gas Service Requirements," and conditions of the applicable Public Utilities Commission Rate Schedule.

307-2.8.1 Distribution Cabinet All cabinets and equipment enclosures installed outdoors shall be NEMA 3/3R construction, conforming to NEMA Publication No. 1CS 1-110.12 and 1CS 1-110.13 and shall be lockable in the manner shown on the plans. Service cabinets shall be factory manufactured, pre-wired units conforming to the plans and specifications, delivered to the job site ready to bolt to the foundation and for connection of service conductors and field wires.

Panelboard and circuit breakers shall be approved and listed by UL. The operating mechanism of the circuit breakers shall be enclosed and shall be trip-free from operating handle or overload and shall be quick-make, quick-break on either automatic or manual operation.

At each circuit breaker, a laminated phenolic name plate, designating the connected circuit, shall be permanently fixed to the panel board.

The equipment shall conform to "Type III Service" of State Standard Specifications, unless otherwise specified.

The contractor shall furnish three sets of wiring diagrams of the service and distribution cabinet showing location and description of components and all wiring connections. One set shall be sealed in plastic and attached to inside of cabinet door.

307-2.8.2 Metering Equipment Meter socket shall meet the requirements of the serving utility and shall be equipped with manual closing devices or space for a test block as per requirement.

307-2.8.3 Service Disconnect Service disconnecting means shall be designed to disconnect all ungrounded conductors simultaneously. Service switches and main breakers shall be installed in dead-front panels or shall be externally operable and lockable in both "On" and "Off" positions.

Electrolier circuits fed from an overhead service drop shall not require a disconnecting means unless shown on the plans.

The disconnecting means in Type 'G' services shall be fused spliced connectors.

307-2.8.4 Circuit Protection All services shall be provided with overcurrent protection in each ungrounded service-entrance conductor. Overcurrent protection devices shall be suitable for the prevailing condition and rated higher than any branch circuit protection device but not higher than the allowable ampacity of the conductors.

Circuit protection for overhead services to electroliers shall be indicating-flag type fuse links installed in the drip loop. Capacity of fuse links shall be 10 Amps when used on a single electrolier where there are no branch circuit protection devices, or 30 Amps when used with branch protection devices, or as specified on the plans. Unless otherwise shown on the plans, the types of fuses to be used where the fused splice connector is to be used as a disconnect shall be NEMA number: FNM-10, FNQ-10, BAF-15, BAN-15 or KTK-15 for service to a single electrolier without branch protection devices, and BAF-30 or KTK-30 when used on circuits with branch protection devices.

All other circuits shall be protected with type NON fuses of suitable capacity or with circuit breakers conforming to Section 307-2.8.1.

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307-4 TRAFFIC SIGNAL CONSTRUCTION

ADD THE FOLLOWING AT END OF **SUBSECTION 307-4.1**:

Maintaining existing and temporary electrical systems shall conform to the provisions in Section 86-1.05, "Maintaining Existing and Temporary Electrical System" of the State Standard Specifications and these specifications.

Scheduling of work shall conform to the provisions in Section 86-1.06, "Scheduling of Work" of the State Standard Specifications.

No lane closure shall be permitted before 9:00 a.m. or after 3:00 p.m. Mondays through Fridays.

The Contractor shall maintain a minimum of two travel lanes for traffic on major streets for use in each direction at all times, and one travel lane for traffic use in each direction on minor streets.

307-4.1.1 Controller Assembly Construction. See Section 209 for Controller Equipment Requirements. The Contractor shall arrange to have a signal technician, qualified to work on the controller and employed by the controller manufacturer or his representative, present at the time the equipment is turned on.

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 307-4.5**:

Conductors and wiring shall conform to the provisions in Section 86-2.08, "Conductors" and Section 86-2.09, "Wiring" of the State Standard Specifications.

Fused splice connectors shall conform to the provisions in Section 86-2.095, "Fused Splice Connectors" of the State Standard Specifications and these Specifications.

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 307-4.6**:

307-4.6.1 Programmed Visibility Traffic Signal Heads. Programmed visibility traffic signal heads shall conform to the provisions in Section 86-4.04, "Programmed Visibility Vehicle Signal Faces" and 86-4.06, "Signal Mounting Assemblies," of the State Standard Specifications and these specifications. The Contractor shall provide a qualified employee to program the programmed visibility signal heads. Programming shall be at the City's direction.

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 307-4.9.1**:

Detectors shall conform to the provisions in Section 86-5, "Detectors", of the State Standard Specifications and these specifications.

Loop detector sensor units shall be Contractor furnished. Detectors shall have eight levels of sensitivity. The detector rack shall be wired to accommodate Phase Green Signal Conditioning to all channels of all detector positions in the detector rack. Inductive loop detectors shall conform to, and be installed in accordance with the State Standard Plans, and as shown on the Contract Plans. The first paragraph of Section 86-5.01 A(4), "Construction Materials" of the State Standard Specifications is amended to read:

"Conductor for each inductive detector loop shall be continuous, unspliced, Type RHW-USE, neoprene-jacketed or Type USE cross-linked polyethylene insulated, No. 12, solid or stranded copper wire. Loop detector lead-in cable shall be Type C."

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ADD THE FOLLOWING TO **SUBSECTION 307-4.10**:

Pedestrian signal heads and auxiliary equipment as shown on the plans, and the installation thereof, shall conform to the provisions in Sections 86-4.05, "Pedestrian Signal Faces" and 86-4.06, "Mounting Assemblies" of the State Standard Specifications and these specifications. Plastic signal heads will not be accepted.

The general construction shall include a single piece cast aluminum housing, a double parabolic reflector, a two color symbol lens, a single piece cast aluminum swing down door frame, a blackout eggcrate-type sun visor, two 116 watt incandescent long life traffic signal lamps, and appropriate sockets and other hardware. Optically, the subject pedestrian signal shall be capable of displaying brightly and uniformly, the alternate symbols "Upraised Hand" in Portland Orange and "Walking Man" in Lunar White while being subject to strong ambient light conditions. Under the same strong ambient light conditions, the symbols shall “Blankout” when the signal is not energized.

a. Dimensions: the maximum overall dimension of the signal shall be 18½ inches wide, 18¾ inches high, and 9 inches deep, including eggcrate type visor and hinges. The signal shall be furnished complete with two 116 watt incandescent traffic signal lamps installed. In order to facilitate installation and maintenance, the signal shall be designed so that all components are readily accessible from the front by merely opening the signal door.

b. Optical System: the optical system shall consist of the following:

1. Symbol lens
2. Double parabolic reflector
3. Lamps and lamp sockets
4. Eggcrate type sun visor

The optical system shall be designed so as to minimize the return of the outside rays entering the unit from above horizontal (known as sun phantom). The optical unit shall be so designed and assembled so that erroneous symbols cannot be displayed by lamp burnout or by light spill over.

c. Symbol Lens: Symbols shall be Lunar White and Portland Orange as defined by the Institute of Transportation Engineer's Standard "Pedestrian Traffic Control Signal Indications".

The lens material shall be 0.187 minimum thickness tempered glass. The tempered glass lens shall be located at least 1.75 inches away from the closest glass envelope extremity of the ANSI Designation 116A21/TS/W traffic signal lamp. The outside of the symbol lens shall be textured to conform to ANSI Designation C-64 "Crepe" or C-66 pattern.

The symbol lens when illuminated shall display "Upraised Hand" in Portland Orange. The other half of the symbol lens when illuminated shall display "Walking Man" in Lunar White.

d. Pedestrian and Bicycle Push Buttons: Pedestrian push buttons shall be Type "B, (9" x 12" frame).

e. Pedestrian and Bicycle Instruction Signs: Pedestrian instruction signs shall be Econolite 9" x 12", Type E-3975, E-3976, E-3981, Caltrans R62C (alternate), or approved equal, with the appropriate arrow indicating direction of crossing (4-screw mount). Vandal-proof stainless steel "one way" screws will be used to install instruction signs. Pedestrian push buttons and signals shall be mounted in accordance with the State Standard Plans and Standard Specifications.

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ADD NEW SUBSECTIONS 307-4.12 THROUGH 307-4.19 SUBSECTIONS TO READ:

307-4.12 Equipment Lists and Drawings. Equipment list and drawings of electrical equipment and material shall conform to the provisions in Section 86-1.03, "Equipment List and Drawings" of the State Standard Specifications and these specifications.

Contractor shall furnish five (5) maintenance operation manuals for all controller units, auxiliary equipment and vehicle detector sensor units, control units and amplifiers. The maintenance manual and operation manual may be combined into one manual. The maintenance manual or combined maintenance and operation manual shall be submitted at the time the controllers are delivered for testing; or, if ordered by the Engineer, previous to purchase. The maintenance manual shall include, but need not be limited to, the following items:

a. Specifications
b. Design Characteristics
c. General Operation Theory
d. Function of all Controls
e. Trouble-shooting Procedure (diagnostic routine)
f. Block Circuit Diagram
g. Geographical Layout of Components
h. Schematic Diagrams
i. List of Replaceable Component Parts with Stock Numbers

Maintenance manuals (5 sets) are required as well as the schematic diagrams. The Contractor shall supply a mylar master for all cabinet wiring documentation.

307-4.13 Pull Boxes. Pull boxes shall conform to the provisions in Section 86-2.06, "Pull Boxes" of the State Standard Specifications.

In addition to the methods for fastening marking strips to metal pull box covers specified in the fourth paragraph of Section 86.2.06B, "Cover Marking" of the State Standard Specifications, strips may be fastened with ¼-inch stainless steel rivets.

Grout in the bottom of pull boxes will not be required. Recesses for suspension of ballasts will not be required.

307-4.14 Traffic Signals and Fittings - Signal faces, signal heads and auxiliary equipment, as shown on the plans, and the installation thereof, shall conform to the provisions in Sections 86-4.01, "Vehicle Signal Faces", 86-4.02, "Directional Louvers"; 86-4.03, "Backplates" and 86-4.06, "Signal Mounting Assemblies" of the State Standard Specifications and these specifications. Plastic signal heads or backplates will not be accepted. All mast arm mounted signal faces and all arrow indications shall be provided with twelve inch sections. Backplates shall be installed on all new and existing vehicle signals.

All signal faces which are not integrated into the system and in operation shall be covered completely with two layers of 6 mil black polyethylene vinyl, secured with wire, and approved by the Engineer until such time as they are either removed and salvaged or put into operation. Lamps shall be provided by the Contractor where new signal heads are installed.

307-4.15 Card Racks. Card racks shall conform to the provisions of the State Standard Specifications and their requirements in "Traffic Signal Control Equipment Specifications", as well as the requirements of this Subsection.

307-4.15.1 Description. Card Racks shall be designed to receive 2-inch wide detector modules including connectors and universal mounting bracketry. Connectors shall be mounted and wired. Card racks shall accommodate plug-in type four channel digital loop vehicle detectors.

307-4.15.2 Construction. Card Racks shall be supplied and installed with a pair of universal mounting brackets. The hardware shall allow it to be assembled for mounting in any desired location within a signal cabinet - side wall, rear wall, suspended under or resting on a shelf.

307-4.15.3 Keying. The Card Rack shall be designed such that when inserting plug-in detector modules will not result in damage either to the modules or connected devices if inadvertently inserted into a wrong position in the card rack. Keys shall be supplied such that the user may key the connectors to prevent insertion of the wrong type of module. In this event, the connectors shall be keyed as follows:

Connector for Module	Key(s)
4 channel digital loop detector	Between pins B & C, M & N and pins V & W
4 channel with delay digital loop detector	Between pins E & F, M & N and pins S & T
Magnetometer detector	Between pins R & S

307-4.15.4 Wiring. Card Racks shall be used with a plug-in power supply. Nominal 24V must not exceed the range of 22 to 28 VDC. Current requirement is 300 milliAmpere per module. Shielded twisted pairs shall be used for loop input leads from the field terminals. The connections marked "(+)" shall be connected to the collector of solid state and optocoupled output options of the detectors. For relay version detectors, these pins shall be wired to the plus or line voltage being switched. Connections marked "(-)" are connected to the emitter of solid state and optocoupled options of the detectors. For relay version detectors, these pins shall be wired to ground or the neutral line of the voltage being switched. Circuit ground wires shall be white or white with a green stripe if connected to earth ground.

307-4.15.5 Installation Instructions. The Card Rack may be mounted in several different orientations. The method of mounting dictates the assembly configuration. In any case, card racks shall be secured in place with four #10 screws. When resting on, or suspended under a shelf, brackets shall space the card rack away from the surface of the shelf. This space shall allow for necessary convection cooling of the modules. The Contractor shall not drill extra holes in the mounting brackets or otherwise defeat this design feature.

307-4.16 Emergency Vehicle Preemption Equipment. The Contractor shall demonstrate that the fire preempt equipment performs satisfactorily as a system. Satisfactory performance shall be determined by having the manufacturer's representatives verify that the system is properly installed per the manufacturer's recommendations, and additionally to perform the following test:

a. The manufacturer's factory trained representatives, a minimum of two people, shall have their own vehicle equipped to test the fire preemption assembly and two-way radios to perform the

test.

b. The test shall be conducted with a distance of 500' to 3000' maintained between the equipped vehicle and the intersection, exact distance as directed by the Engineer.

c. As necessary the timing and range shall be adjusted as necessary and re-tested (fine tuning procedure).

d. The manufacturer shall furnish written certification, signed by the manufacturer's factory trained representatives, indicating date, time, selected features, effective usage parameters, and all other pertinent data as a result of the installation and testing, to the Engineer.

Full compensation for testing fire preemption equipment shall be considered as included in the lump sum price paid for the traffic signal work and no additional compensation will be allowed.

307-4.17 Auxiliary Equipment - Auxiliary equipment shall comply with Sections 86-1.01 through 86-1.07, 86-2.14 and 86-3 of the State Standard Specifications and these specifications.

307-4.18 Inductive Loop Detector Testing Device - The City will employ a portable testing device to test inductive loops. The purpose of this device is to monitor the output of the inductive loop amplifiers. As applicable, the equipment hereinafter described shall conform to the State Standard Specifications as follows:

Section 86-3.06	Type 90 Controller Assembly
Section 86-3.07C	Cabinet Wiring
Section 86-3.07D	Cabinet Accessories
Section 86-3.08	Auxiliary Equipment
Section 86-3.08I	Special Timing

The device is a means of audibly and visually perceiving the positive detection of an approaching vehicle or bicycle.

The output of each inductive loop amplifier channel shall be wired to a pin designation of a Military Spec (MS) type connector conforming to State Standard Specification Section 86-3.06 (MIL-C.2642 Series). The receptacle portion of the MS connector shall be mounted on the left inside wall of the controller cabinet in an easily accessible location to allow suitable installation of the MS connector and its attendant wiring to the card rack. The Contractor shall install the receptacle portion of MS connector in the cabinet and shall include that cost in the bid for the controller/cabinet assembly.

307-4.19 Traffic Signal Dimming Device - Each new traffic controller unit shall provide dimming by phase and by color. Dimming shall be accomplished by inhibiting the programmed outputs for alternate half cycles of 115 VAC. Dimming shall be controlled by time-of-day and an external input. Both functions must be TRUE for dimming to occur. Programming shall permit dimming the green, yellow, red, "walk", and "don't walk" outputs of each phase and overlap. The external input shall be activated by means of a photoelectric unit installed by the Contractor on a

traffic signal pole adjacent to the controller cabinet.

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 307-5.1**:

Testing of traffic equipment shall conform to the provisions in Section 86-1.03, "Equipment List and Drawings", Section 86-2.14, "Testing", Section 86-3.05, "Controller Assembly Testing", of the State Standard Specifications and these specifications. Testing for each cabinet will begin ONLY after ALL schematic wiring diagrams of the controller units and auxiliary equipment, all cabinet diagrams, and all operation manuals have been submitted. These diagrams shall show in detail all circuits and parts. Such parts shown thereon shall be identified by name or number and in such manner as to be readily interpreted. Testing can be performed by a private testing firm.

All diagrams, plans and drawings shall be prepared using graphic symbols shown in ANSI publication Y32.2, entitled "IEEE Standard and American National Standard Graphic Symbols for Electrical and Electronic Diagrams." Contractor shall deliver the equipment to the City's designated testing facility at Signal Maintenance Inc. (SMI), 3395 Viso Court, Santa Clara, CA 95054, and pick it up when testing is complete.

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REVISE SUBSECTION 307-6 TO READ:

307-6 Painting Painting of electrical equipment and materials shall conform to the provisions of Section 310 of these Specifications with the modifications that are indicated in this Subsection.

Galvanizing and painting of all traffic controller cabinets, traffic signal standards, mast arms, and luminaire arms shall conform to the provisions in Sections 86-2.15 "Galvanizing" and 86-2.16, "Painting", of the State Standard Specifications.

The Engineer reserves the right to require the use of brushes for the application of paint, should the work done by the paint spraying machine prove unsatisfactory or objectionable, as determined by the Engineer. Paint may be applied to equipment and materials for electrical installations at any time permitted by the Engineer.

Paints to be applied to new electrical equipment metal surfaces shall consist of (nominally) a prime coat, intermediate coat, and two (2) finish coats. The total dry film thickness of prime and intermediate coats shall be not less than three (3) mils and the total dry film thickness of the two (2) finish coats shall be not less than two (2) mils.

Reused equipment previously finished, after cleaning, shall be given a spot finishing coat on newly primed areas, followed by one finishing coat over the entire surface. Excessively thick coats of paint application will not be permitted. The thickness of each coat of paint shall be limited to that which will result in uniform drying throughout the paint film thickness. Succeeding coats of

paint shall be of such a shade as to contrast sharply with the coat being covered. The dry film thickness of the paint will be measured in place with a calibrated magnetic film thickness gauge by the Engineer. Factory finish on new equipment will be acceptable if of proper color, and if equal in quality to the specified finish. Factory or shop cleaning methods for metals will be acceptable if equal to the methods as specified in Section 310. Conduit and conduit fittings above ground shall be prepared and finished in the same manner as the adjacent standard or post.

The prime coat for all new electrical equipment to be painted shall be Zinc-Rich Primer, Organic Vehicle type (State Specification 8010-31A-36) Type I, Red tint — see Section 91-2.01 State Standard Specifications. The intermediate coat may be either the Zinc-Rich Primer above or a commercial quality Zinc-Chromate fast drying primer. If Zinc-Chromate primer is used, as intermediate coat, the prime coat must be pretreated with Pre-Treatment, Vinyl Wash Primer (State Specification 8010-31A-27) — see State Standard Specification Section 91-2.07.

Reused existing or furnished used equipment, after cleaning, shall be coated with Pre-Treatment, Vinyl Wash Primer followed by one coat of commercial quality Zinc-Chromate primer.

If an approved prime coat has been applied by the manufacturer, and it is in good condition, the first primer application by the Contractor will not be required.

Unless otherwise specified in the Special Provisions, the finish coat for all signal heads, mounting brackets and fittings, hood exteriors, pedestrian signal heads, push bottom housings, and back faces of back plates shall be finished with two (2) coats of Enamel; Traffic Signal, Dark Olive Green (State Specification 8010-71G-14) — see Section 91-4.02 State Standard Specifications.

Galvanized equipment, traffic signal poles, and wood poles for traffic signal or flashing beacon installations shall not be painted unless specified in the Special Provisions or on the Plans.

Two finishing coats of Aluminum Paint, Finish Coat, (State Specification 8010-31A-45 — see Section 91-2.08 State Standard Specifications) shall be applied to the following non-galvanized equipment: controller cabinets, and exterior surfaces and edges of rain tight enclosures (switches, service, series circuit cutouts, control equipment, transformers, etc.).

Interior of signal hoods, louvers and front faces of back plates shall be finished with two (2) coats of Enamel; Traffic Signal, Lusterless Black, State Specification 8010-71G-13 (see State Standard Specifications) except that factory enamel finish in good condition will be acceptable.

Painting of outside of signal heads and other signal equipment, which have been factory enameled in dark olive green and are in good condition, may be omitted at the discretion of the Engineer.

Galvanized metal guard posts shall not be painted.

After erection, all exterior surfaces shall be examined for damage, and any such damaged surfaces shall be cleaned and spot coated with finish coat of the same shade as the previously applied finish coat. If the spot painting does not match the previously applied finish coat, after

drying, then the entire surface shall be repainted.

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REVISE SUBSECTION 307-7 TO READ:

307-7 Salvaging and Reinstalling of Stocked Electrical Equipment. Salvaging and reinstalling or stocked electrical equipment shall conform to the provisions in Section 86-7, "Salvaging and Reinstalling of Stocked Electrical Equipment" of the State Standard Specifications and these Specifications. All equipment specified to be removed and salvaged shall be delivered in good order to the City Yard, under Wolfe Road overpass at Kifer Road, Sunnyvale, or to Signal Maintenance Inc. (SMI), 3395 Viso Court, Santa Clara, CA 95054.

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RENUMBER SUBSECTION 307-8 "PAYMENT" TO BE 307-9 AND INSERT NEW SUBSECTION 307-8 THAT READS:

307-8 TRAFFIC SIGNS. All signs shall conform to the applicable State Sign Specification Sheets (issued by the State of California, Department of Transportation). The installation of street and traffic signs shall include all work and materials, including posts and mounting hardware necessary for installation, complete, in place. In the event that the size of sign is not noted, the Contractor shall supply the `standard' size. `Minimum' size signs will not be acceptable.

SECTION 308 — LANDSCAPE AND IRRIGATION INSTALLATION METHODS

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 308-1**.

The irrigation system shall efficiently and evenly irrigate all areas and shall be complete in every respect, and shall be ready for operation to the satisfaction of the Engineer.

The Contractor shall provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the types of materials being installed and the manufacturer's recommendations as to the method of installation and who shall direct all work performed under this section.

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 308-2.1**:

No import topsoil shall be procured or placed on site prior to Engineer's approval.

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ADD THE FOLLOWING SUBSECTIONS 308-2.4.1 THROUGH 308-2.4.3 TO **SUBSECTION 308-2.4**:

308-2.4.1 Required Density. Density of all topsoil to be eighty-five percent (85%) relative compaction as determined by California Test Method No. 216.

308-2.4.2 Layers. Topsoil shall be brought up to grade in layers not exceeding twelve inches (12"). Final lift to be placed to eighty percent (80%) maximum relative compaction.

308-2.4.3 Finish Surfaces and Drainage. All ground surfaces are to be finished to uniform grades and slopes as shown on the plans, to drain properly and to be free from depressions which may cause areas of standing water.

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 308-4.1**:

Planting shall not be performed during rainy or other inclement or hazardous weather conditions.

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DELETE THE FOURTH PARAGRAPH AND SUBSTITUTE WITH THE FOLLOWING:

Special Backfill Mix for Tree and Shrub Holes — Backfill all tree and shrub holes with the following proportioned mix per cubic yard:

a) 2/3 cubic yard of loose measure soil from excavated holes
b) 1/3 cubic yard of loose measure redwood nitrogenized (0.5% nitrogen) sawdust
c) Agriform planting tablets at the rate of:

1 gallon plants -	1 tablet
5 gallon plants -	3 tablets
15 gallon plants	5 tablets
Boxed material	1 tablet per 1/2 inch tree trunk diameter measured one foot from top of root ball

Thoroughly mix, leaving no layers of amendments.

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ADD THE FOLLOWING AT THE END OF **SUBSECTION 308-4.9.3**:

Furnish and install mulch at 2" depth throughout all planted shrub and tree areas.

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ADD THE FOLLOWING NEW SUBSECTIONS 308-4.10 THROUGH 308-4.13:

308-4.10 Anti-Transpirant Spray. Two applications of an anti-transpirant material shall be sprayed on trees. The first spraying shall be applied when directed by the Engineer and in accordance with the manufacturer's recommendation.

308-4.11 Preemergent. Upon completion of all planting operations, and prior to placing mulch, apply Ronstar, Surflan, or equivalent preemergent herbicide at recommended label rates and upon completion activate the irrigation system to soak the preemergent. Basins shall be left around plants unless otherwise specified or directed by the Engineer.

308-4.12 Root Control Barrier. A root control barrier shall be installed in all tree wells located in median noses. Median noses are defined to be the narrow portions of the median islands at the beginning and end of each island where tree roots are surrounded by concrete planting areas, limiting allowable root spread. Root control barrier shall be installed in accordance with the manufacturer's specifications and to the approval of the Engineer.

308-4.13 Planting - General Clean Up. After all planting operations are completed, all planted areas shall be cultivated to a 2" depth, and then shall be maintained watered and free of weeds until final job acceptance. In addition, the Contractor shall remove all cans, surplus materials, and other debris from the site, and shall neatly dress and finish all planting areas and flush clean all walk and paved areas to the satisfaction of the Engineer.

Page 383

ADD THE FOLLOWING AT THE END OF **SUBSECTION 308-5.1**:

One copy of the approved schematic wiring diagram and one copy of the "RECORD DRAWINGS" irrigation plan, showing the equipment controlled by the irrigation controller and the location and station number for each electric remote control valve, shall be laminated in plastic and securely mounted inside the controller door. The installation date and controller's guarantee expiration date shall be permanently marked inside the controller. A maintenance and operations manual for each controller shall be submitted to the Engineer when the approved wiring diagram is

placed inside the controller.

308-5.1.1 Sleeves. Sleeves and conduits for underground installations shall conform to requirements of this Subsection; and shall be of size, type and location, as indicated on the plans, and as directed by the engineer.

Contractor shall install PVC sleeves and conduit around pipe and wire that pass through or under concrete paving and walks and as required to facilitate a smooth construction sequence. Sleeves and conduit shall be sized as indicated on the plans. Rigid metal sleeves and conduits shall be provided for all irrigation lines and control wires located under asphalt pavement. Contractor shall coordinate sleeve installation with other trades, as required.

Page 384

ADD THE FOLLOWING AT THE END OF **SUBSECTION 308-5.2.1**:

Concrete thrust blocks shall be as detailed on the plans.

Page 386

ADD THE FOLLOWING AT THE END OF **SUBSECTION 308-5.4.3**:

Contractor shall install check valves on sprinkler riser assemblies as detailed, or where otherwise needed if low head drainage occurs for a pipe run.

Page 386

ADD THE FOLLOWING AT THE END OF **SUBSECTION 308-5.4.4**:

Contractor shall prevent water spraying onto non-irrigated areas.

Page 387

ADD THE FOLLOWING AT THE END OF THE FIRST SENTENCE OF THE SECOND PARAGRAPH OF **SUBSECTION 308-5.5**:

... or as directed by the Engineer.

Page 388

ADD NEW SUBSECTION **308-5.7** THAT READS:

308-5.7 Inspection The Contractor shall submit written requests for inspections to the Engineer at least 48 hours prior to time(s) of the required inspections. Inspections of completed installation will be made by the Engineer during the performance of hydrostatic testing and prior to backfilling of trenches.

Page 388

ADD THE FOLLOWING AT THE BEGINNING OF **SUBSECTION 308-6**:

Immediately replace any plant materials that die or are damaged. Replacements shall be made to the same specifications as required for original plantings.

Page 389

REVISE SUBSECTION 308-7 SO THAT IT READS:

308-7 GUARANTEE: All trees, shrubs, ground covers, and other plant materials shall be guaranteed to take root, grow, and thrive for a period of one year after final acceptance of work.

Any trees or other plant materials that die back and lose the form and size originally specified, shall be replaced, even though they have taken root and are growing after the dieback.

Within 15 days of written notification by the City, remove and replace all guaranteed plant materials which, for any reason, fail to meet the requirements of guaranty. Replacements, at the contractor's expense, shall be made to same specifications as required for the original materials and shall carry the same guarantee from the time they are replaced.

SECTION 310 — PAINTING

Page 398

ADD THE FOLLOWING AT THE END OF **SUBSECTION 310-5.6.1**:

All legends, striping and markers shall be placed in locations as shown on the plans. Any crosswalks, legends, arrows, or striping installed prior to the installation of the inductive loop detectors will be rejected by the Engineer. The rejected work shall be completely removed and reinstalled at the expense of the Contractor.

Pavement markers shall conform to the provisions of Section 85, "Pavement Markers", of the State Standard Specifications and shall be of the type shown on the plans. Conflicting pavement markers shall be removed as required.

Paint shall be fast drying traffic paint, as manufactured by Minnesota Mining and Manufacturing Company or J.E. Bauer, or equal.

All markings for all crosswalks, legends and 8" solid white lines shall be thermoplastic in accordance with Section 84, Traffic Stripes & Pavement Markers", of the State Standard Specifications.

All paving surfaces to which painted markings are to be applied shall be dry and "broom clean".

The Contractor shall be responsible for accurately locating the lines and positions of all traffic lines directional lines, arrows and other markings in accordance with the plans and City standard markings by cat tracking with painted marks. Where new detector loops are to be installed, the Contractor shall mark the new lane lines so that the new detector loops can be installed accurately.

Prior to painting, the Contractor shall call for review and approval of the proposed striping by the Engineer. The City shall have the right to make changes in the location and alignment of lane stripes and pavement markings.

Painting shall be done either by spray method using masking templates as required, or the striping shall be done by means of a mobile device approved by the Engineer. The method used shall produce markings with clearly defined edges and with no paint splatter on adjacent surfaces.

Paint shall be applied in sufficient quantity to cover the surface completely in one application. Rate of application of paint and beads shall be 8 to 11 gallons per mile for broken single stripe and 17 to 18 gallons per mile for double solid stripe. Minimum thickness of application shall be 10 mils.

The Contractor shall provide suitable barriers, warning signs and/or other arrangements to keep both foot, bicycle and vehicular traffic away from the freshly painted surfaces until the paint is thoroughly dry.

Page 403

ADD THE FOLLOWING AT THE END OF **SUBSECTION 310-5.6.10**:

All required pavement striping, and marking will be performed by the Contractor unless otherwise noted on the Plans or otherwise specified elsewhere in these Specifications

SECTION 311 — SPECIAL PROTECTIVE MATERIALS

Page 410

CHANGE THE SUBSECTION REFERENCES IN THE FIRST AND THIRD PARAGRAPHS OF **SUBSECTION 311-1.10** FROM 210-2.3.7 TO 210-2.3.6.

END OF PART 3

PART 4 — ALTERNATE ROCK PRODUCTS, ASPHALT CONCRETE, PORTLAND CEMENT CONCRETE AND UNTREATED BASE MATERIAL

Part 4 — Alternate Rock Products, Asphalt Concrete, Portland Cement Concrete And Untreated Base Material, shall consist of Part 4 of Alternate Rock Products, Asphalt Concrete, Portland Cement Concrete And Untreated Base Material Provisions of the "Greenbook" Standard Specifications for Public Works Construction, 2000 Edition, written and promulgated by Public Works Standards, Inc.

PART 5 — SYSTEM REHABILITATION

Part 5 — System Rehabilitation, shall consist of Part 5 of System Rehabilitation Provisions of the "Greenbook" Standard Specifications for Public Works Construction, 2000 Edition, written and promulgated by Public Works Standards, Inc.

PART 6 — MODIFIED ASPHALTS, PAVEMENTS AND PROCESSES

Part 6 — Modified Asphalts, Pavements and Processes, shall consist of Part 6 of Modified Asphalts, Pavements and Processes of the "Greenbook" Standard Specifications for Public Works Construction, 2000 Edition, written and promulgated by Public Works Standards, Inc.

END OF PARTS 4, 5, AND 6

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CITY OF SUNNYVALE

STANDARD DETAILS

FOR PUBLIC WORKS CONSTRUCTION

2000 EDITION

July, 2000

Department of Public Works
City of Sunnyvale
P.O. Box 3707
Sunnyvale, CA 94088-3707

Telephone: (408) 730-7415
Fax: (408) 730-7286

TABLE OF CONTENTS

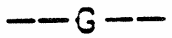
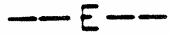
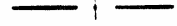
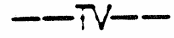
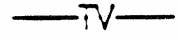
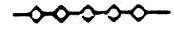
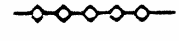
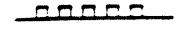
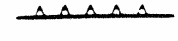
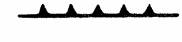
SECTION C — STREETS

SECTION D — ELECTROLIERS AND ELECTRICAL

SECTION E — SIGNS, STRIPING AND CHANNELIZATION

City of Sunnyvale
Department of Public Works

Drafting Symbols

Existing	New	
		Sanitary Sewer
		Storm Drain
		Gas Lines
		Electrical Duct
		High Pressure Sodium Electrolier
		Telephone Duct (Conduit)
		Cable TV Conduit
		Concrete Barrier
		Guard Railing
		Wall (Retaining, Sound as Noted)
		Handicap Ramp
		Curb with Gutter
		Curb without Gutter
		Sidewalk (Width as Noted)

Notes: 1. Traffic signs on plans shall be designated by State of California, uniform sign chart number.

2. All lines, ducts, and conduits shall indicate the size on plan.

DRAFTING SYMBOLS- 1 OF 2

Mark A. Rose
APPROVED BY:

DATE: AUG. 30, 1995

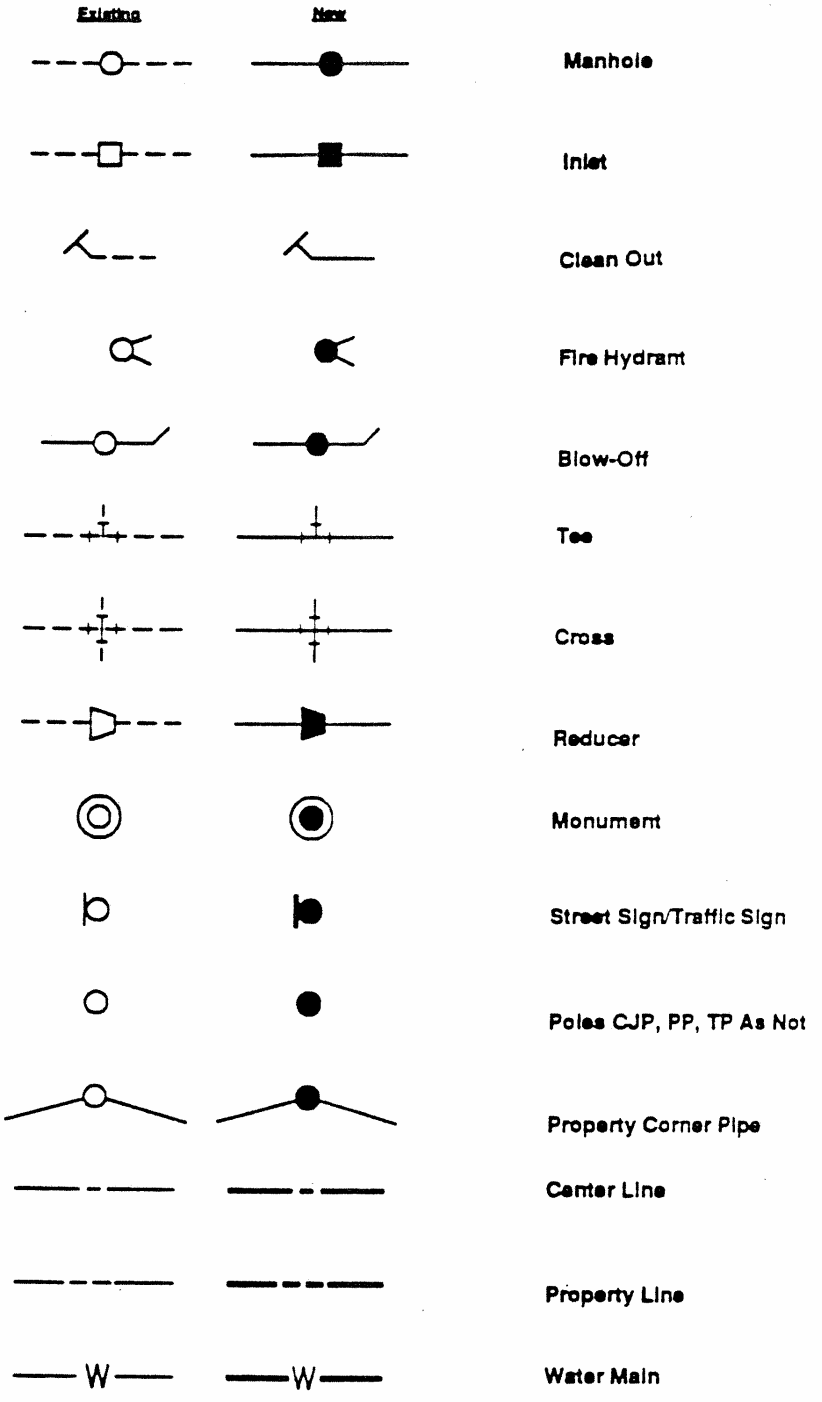
REV. DATE: JULY 2000

DWG. # 1

2000 STANDARD DETAILS

City of Sunnyvale
Department of Public Works

Drafting Symbols

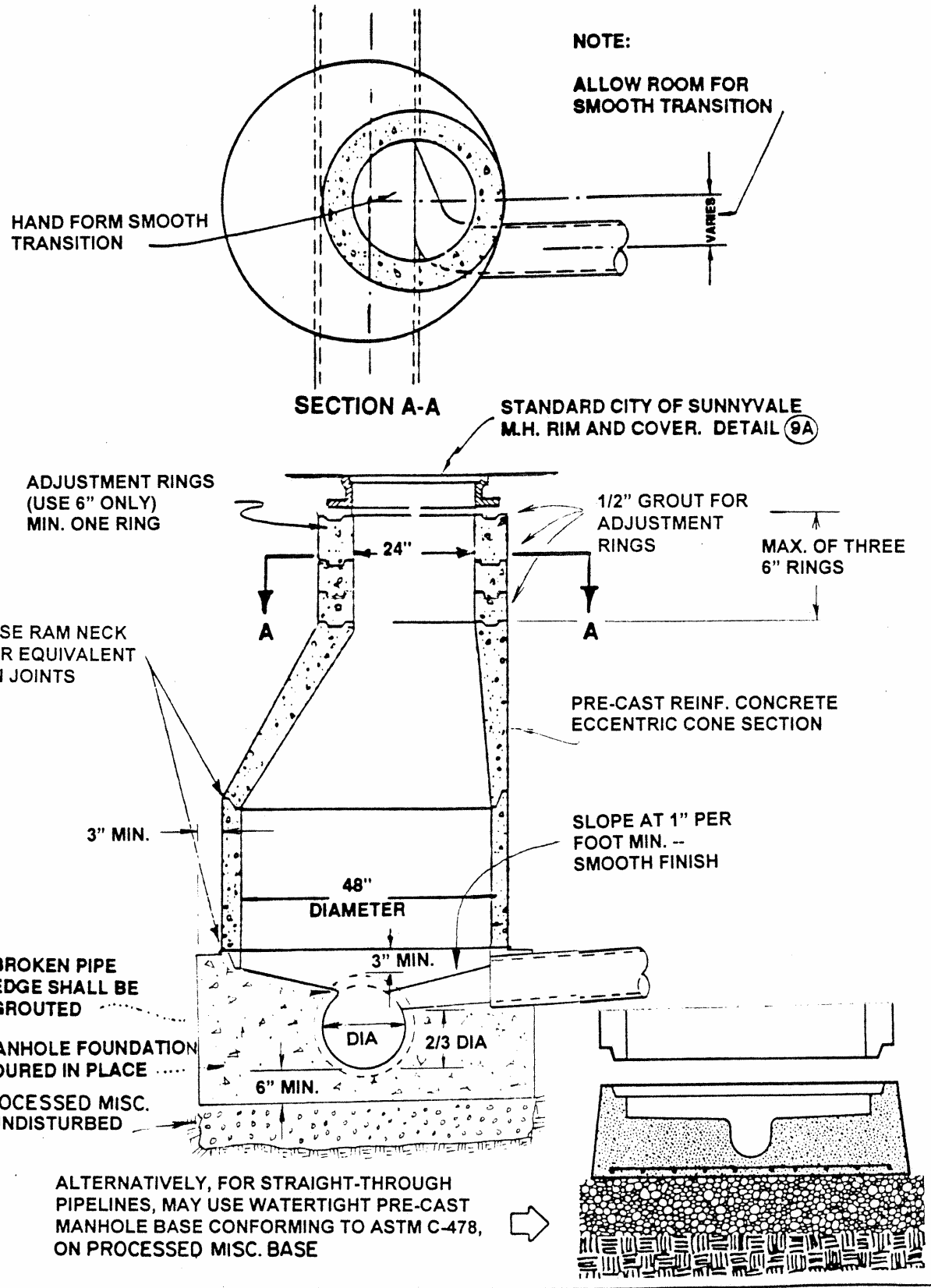


DRAFTING SYMBOLS - 2 OF 2

APPROVED BY: Mauro A. Rose

DATE: AUG. 30, 1995
REV. DATE: JULY 2000
DWG. 2

2000 STANDARD DETAILS



TYPE I-ECCENTRIC MANHOLE

8" TO 33" PIPE

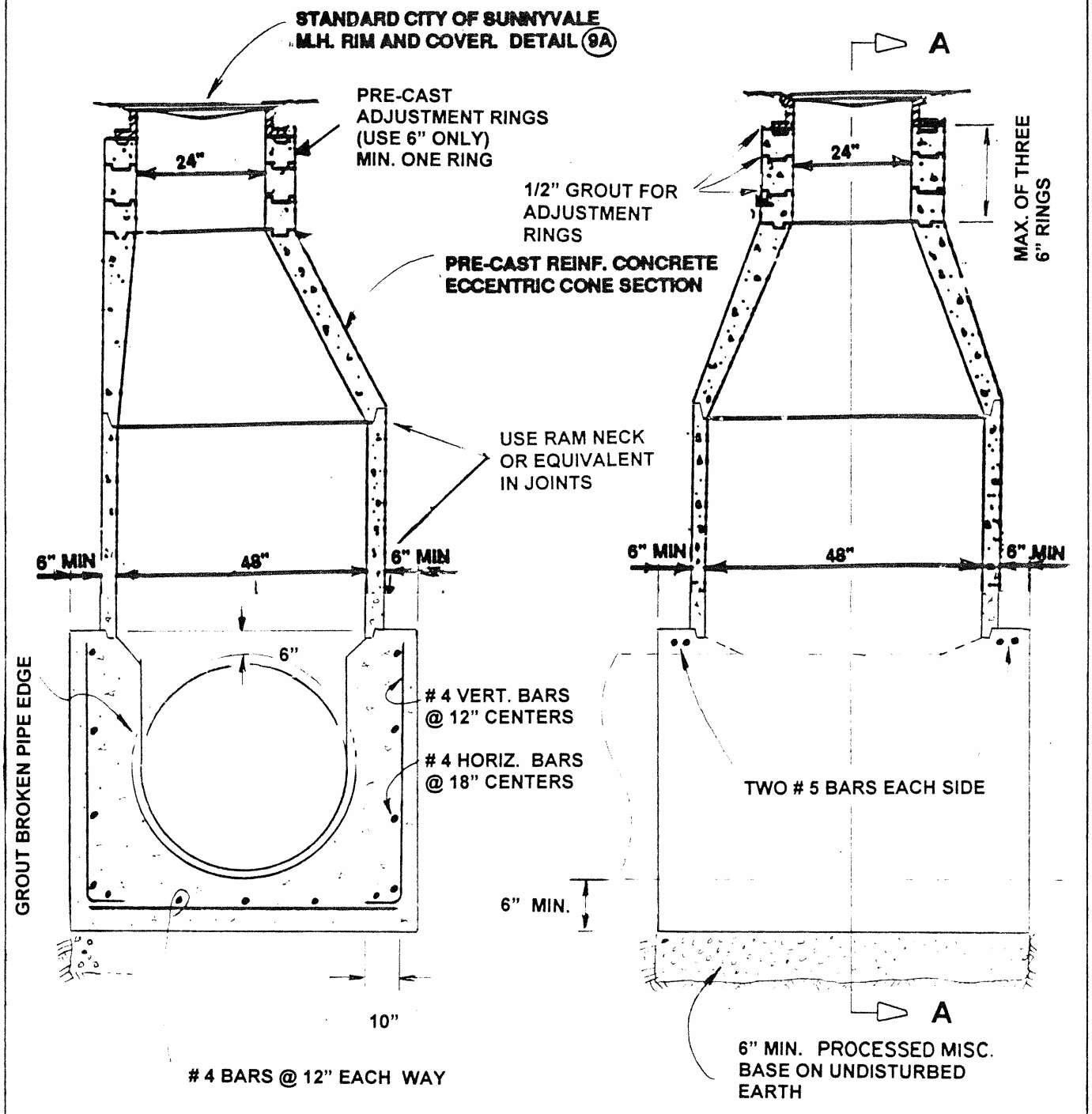
APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 2000

DRWG. 1A

2000 STANDARD DETAILS



SECTION A - A

NOTES:

1 CENTER PIPE IN MANHOLE BASE

2 3" MIN. COVER TO ALL REINFORCING STEEL

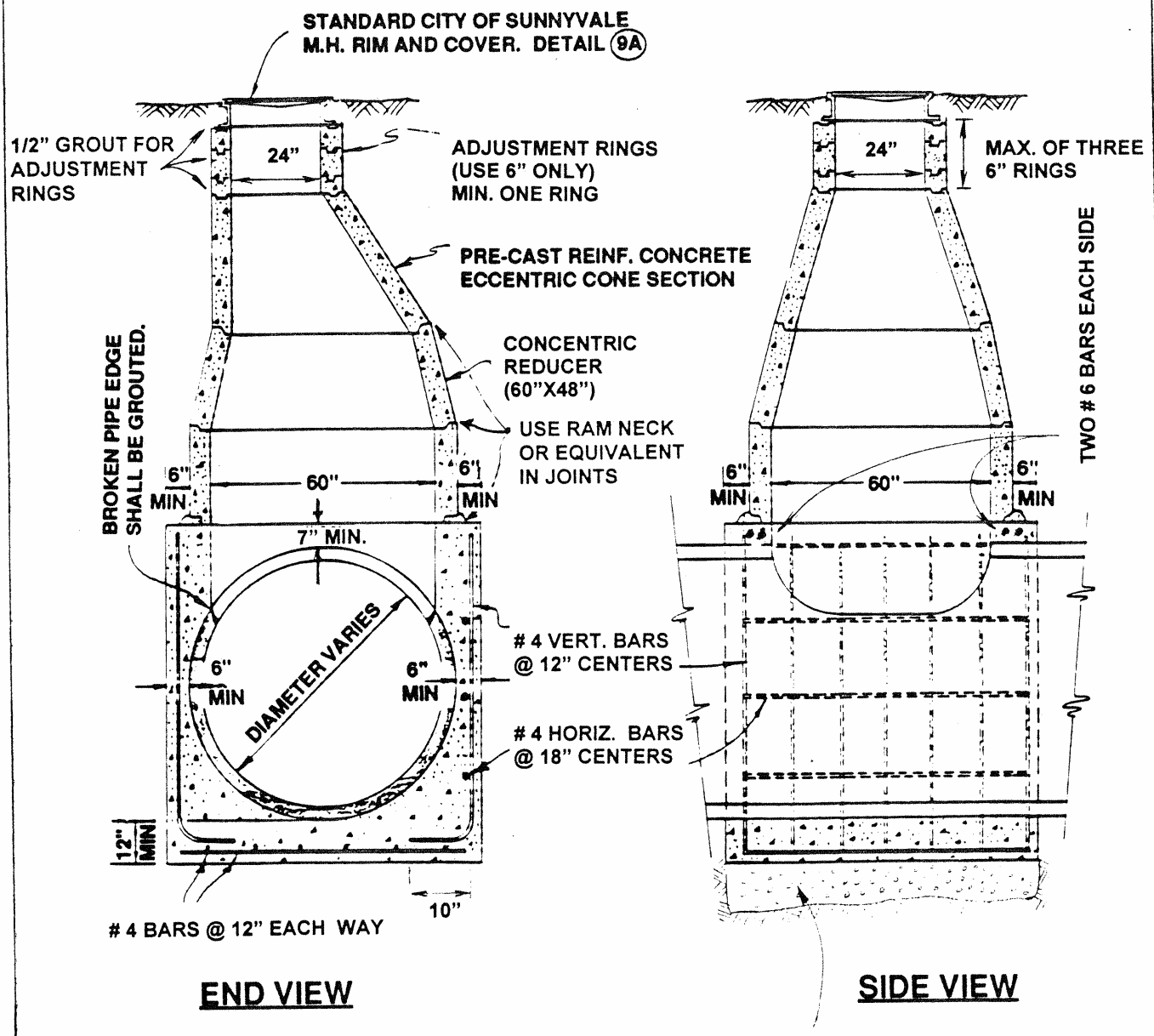
TYPE II - ECCENTRIC MANHOLE 36" TO 48" PIPE

Marvin A. Rose
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

DRWG. 2A

2000 STANDARD DETAILS



NOTES:

1 CENTER PIPE IN MANHOLE BASE

2 3" MIN. COVER TO ALL REINFORCING STEEL

TYPE III - ECCENTRIC MANHOLE

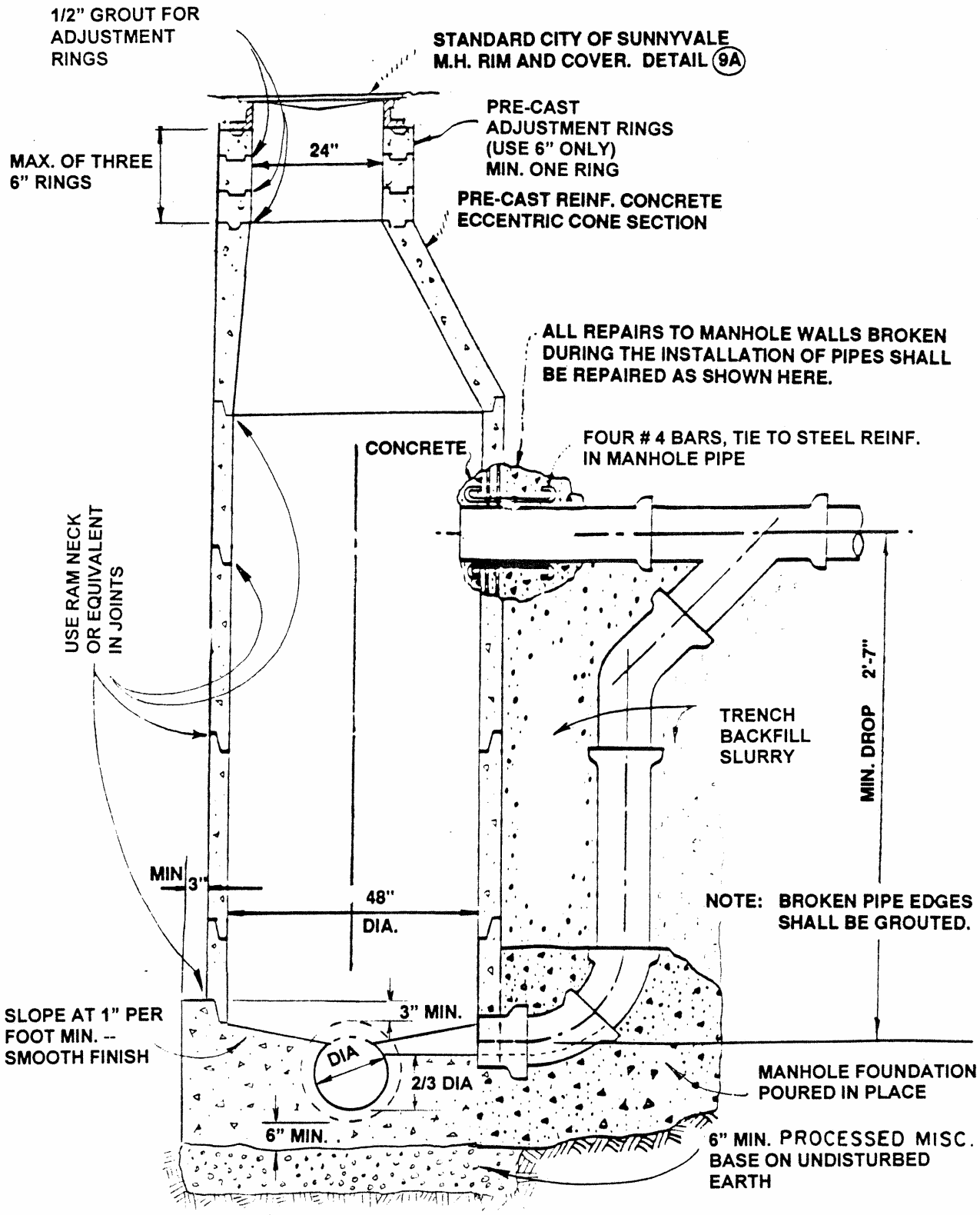
51" PIPE & LARGER

Marvin A. Rose
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

DWG. 3A

2000 STANDARD DETAILS



TYPE IV-

ECCENTRIC DROP MANHOLE

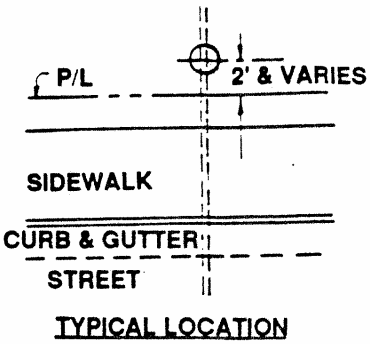
CITY OF SUNNYVALE CALIFORNIA

Marvin A. Rose
APPROVED BY:

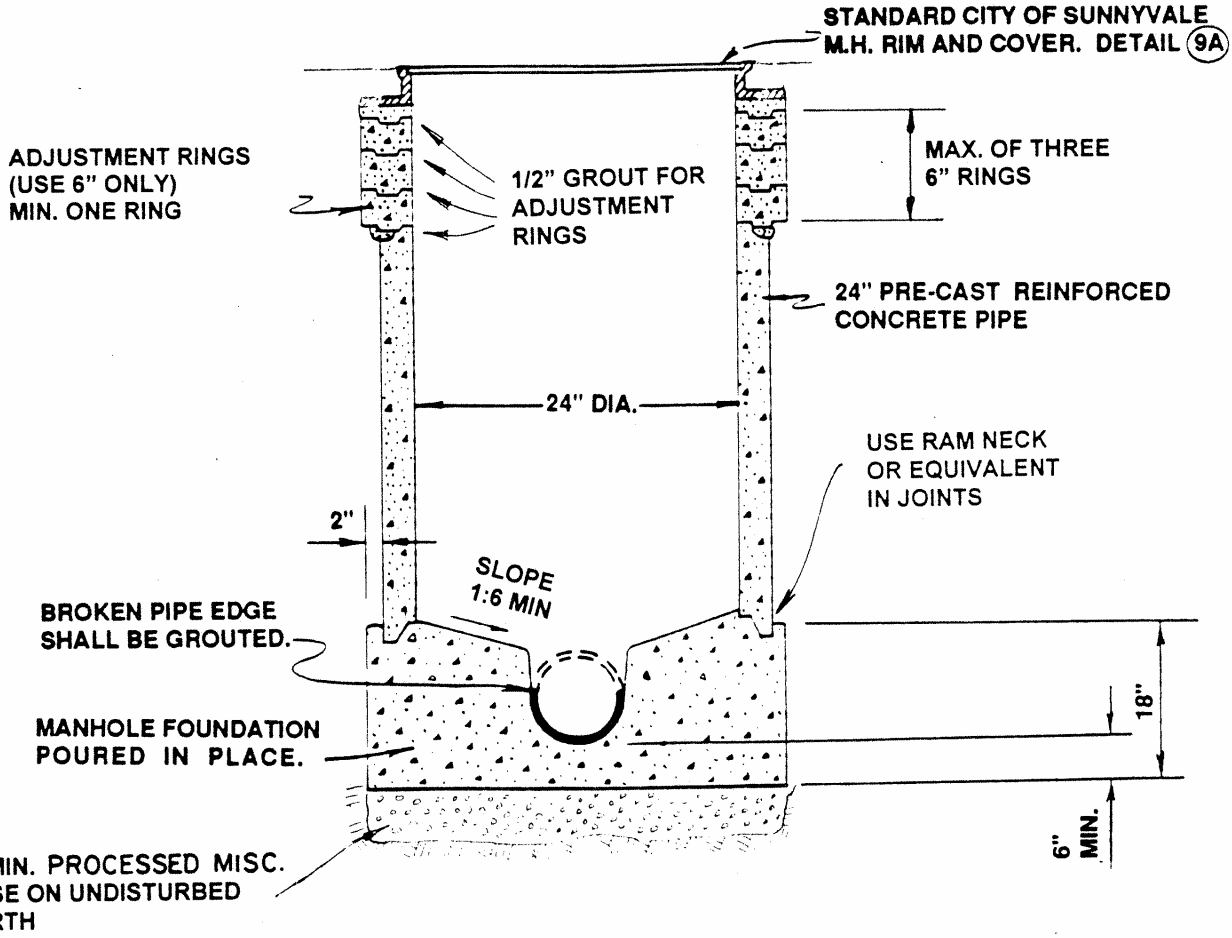
DATE: JUNE 30, 1991
REV. DATE: JULY 2000

DWG. 4A

2000 STANDARD DETAILS



TYPICAL LOCATION



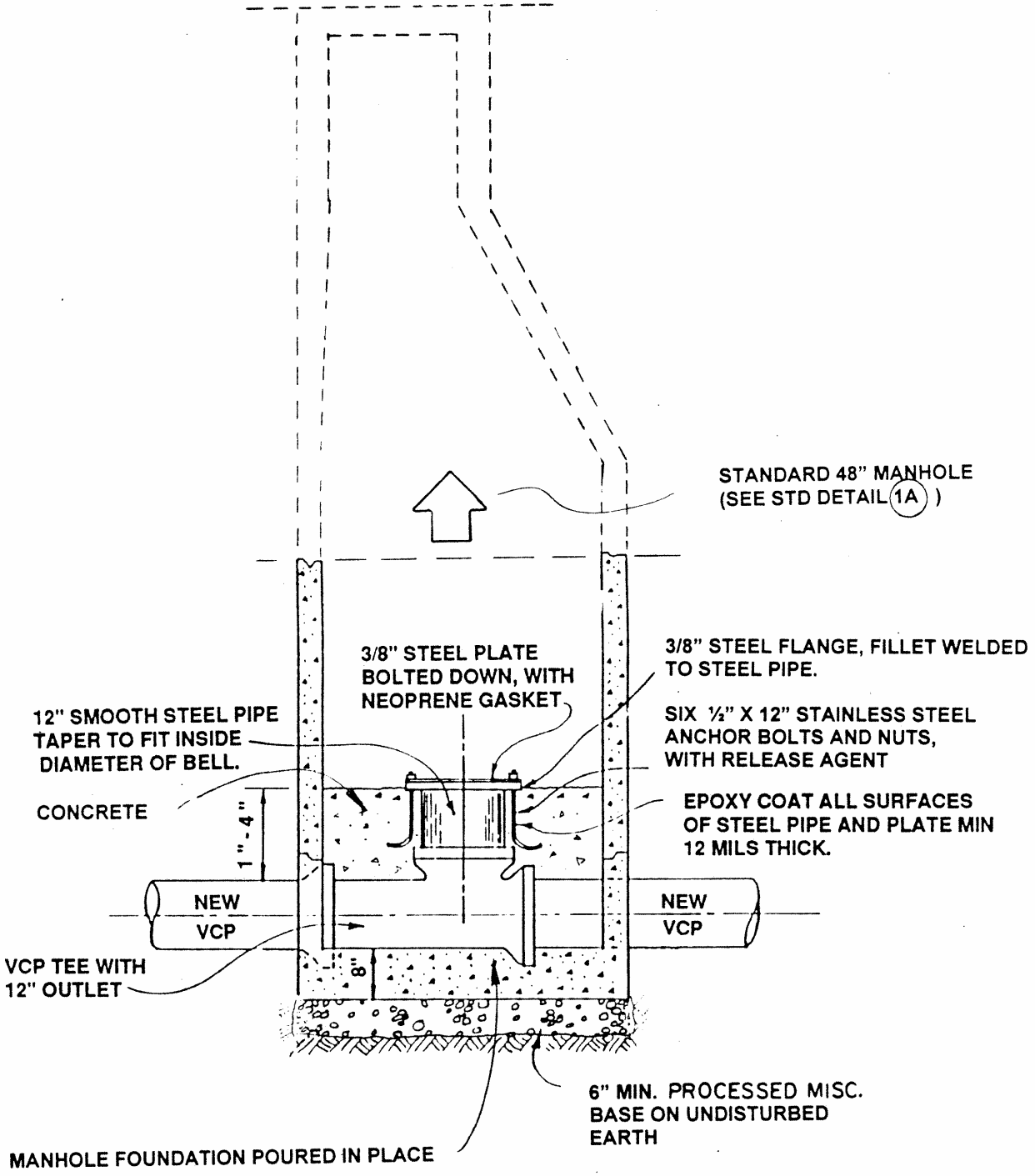
TYPE VI-INDUSTRIAL WASTE MANHOLE 4" TO 12" PIPE

Marvin A. Rose
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

DRWG. 6A

2000 STANDARD DETAILS



TYPE VII MANHOLE, PRESSURIZED

(FOR NEW INSTALLATIONS)

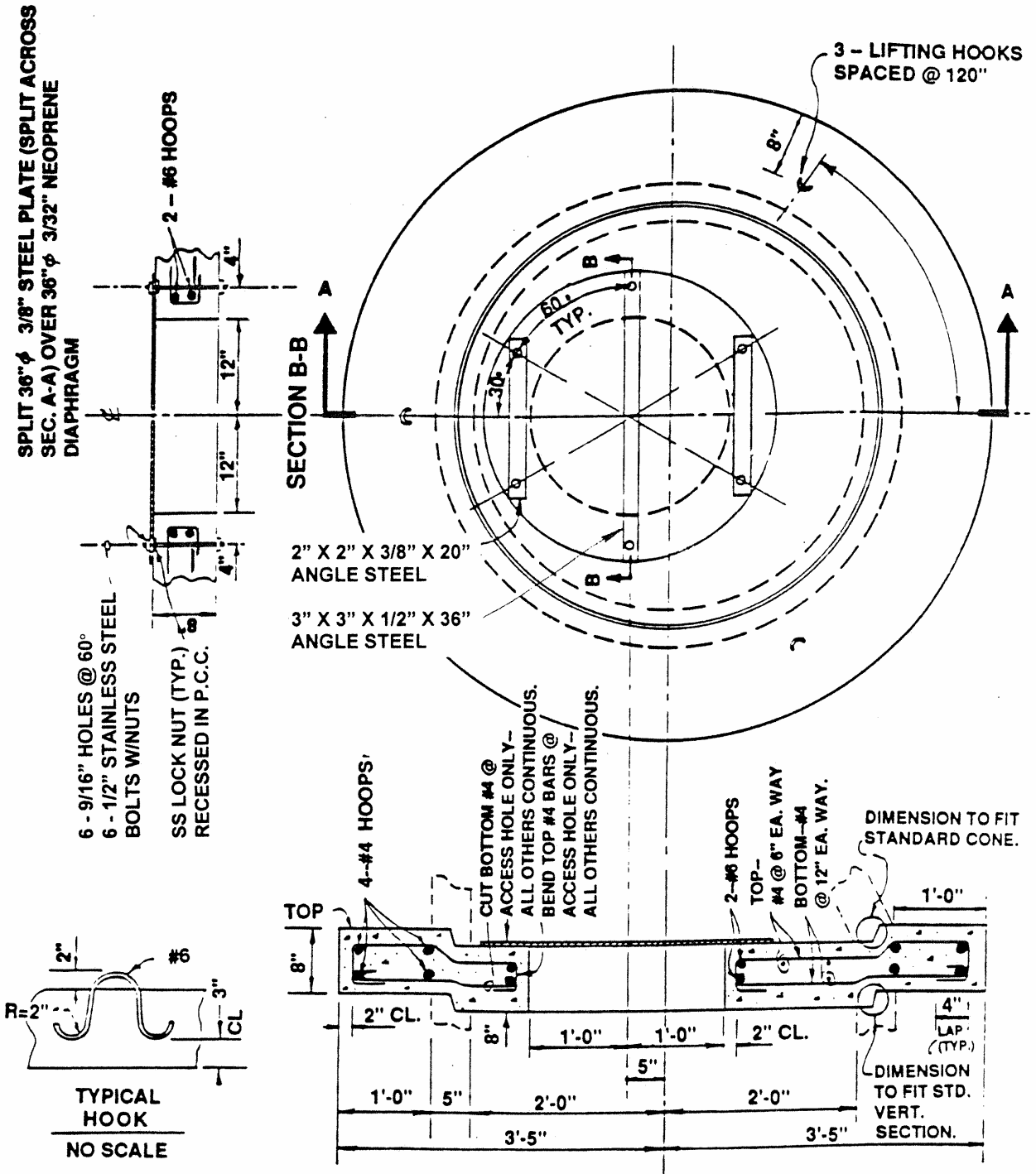
APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 2000

DRWG. 7A

2000 STANDARD DETAILS



REMOVE MANHOLE TAPERED CONE SECTION AND PLACE THE PRECAST CONCRETE PRESSURE CAP ON THE TOP OF THE PARALLEL PIPE SECTION. REINSTALL THE TAPERED CONE SECTION AND RECONSTRUCT THE MANHOLE TOP.

TYPE VIII MANHOLE, PRESSURIZED

(FOR EXISTING INSTALLATIONS)

APPROVED BY:

DATE: JUNE 30, 1991

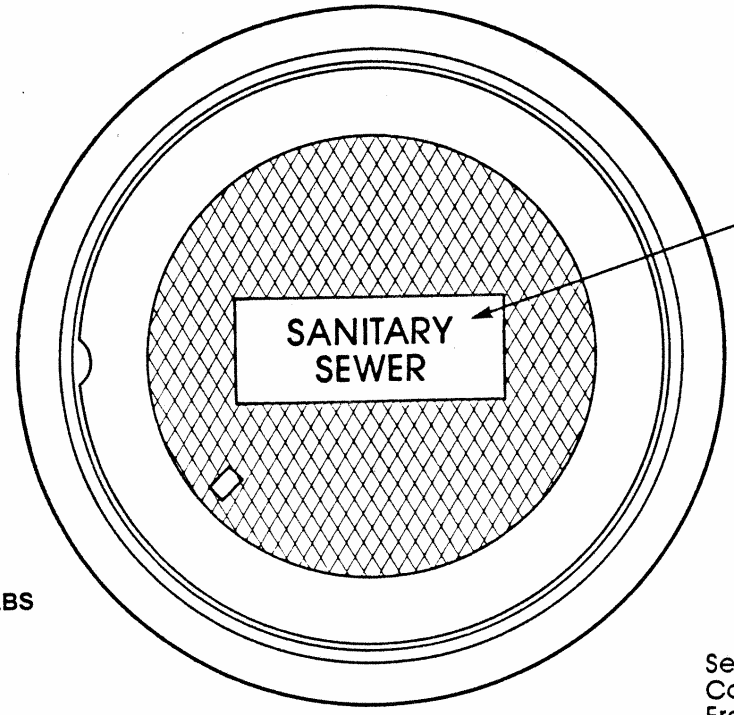
REV. DATE: JULY 2000

DRWG. 8A

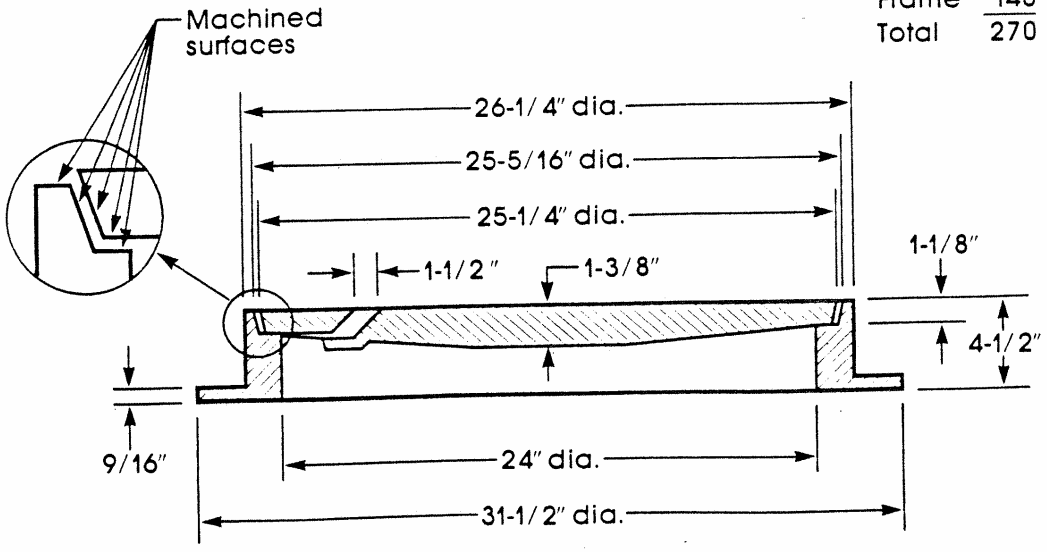
2000 STANDARD DETAILS

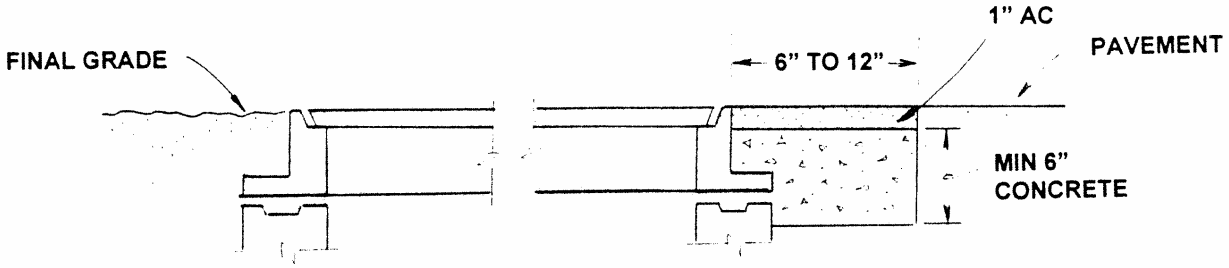
ALL MATERIALS USED IN MANUFACTURING SHALL CONFORM TO A.S.T.M. 48-30.
FRAME AND COVER BEARING SURFACES SHALL BE MACHINED TO ASSURE QUIET FIT
COVER MARKINGS SHALL BE "SANITARY SEWER" OR "STORM SEWER" UNLESS OTHERWISE SPECIFIED.
CASTINGS SHALL BE DIPPED IN BLACK BITUMINOUS PAINT.
MANUFACTURER SHALL CERTIFY THAT FRAME AND COVER MEET ALL LOAD REQUIREMENTS FOR H-20 HIGHWAY LOADING

MINIMUM WEIGHT OF SET 270 LBS



Set Weight
Cover 130
Frame 140
Total 270 lbs





DETAIL FOR NON-PAVED SURFACE

DETAIL FOR PAVED SURFACE

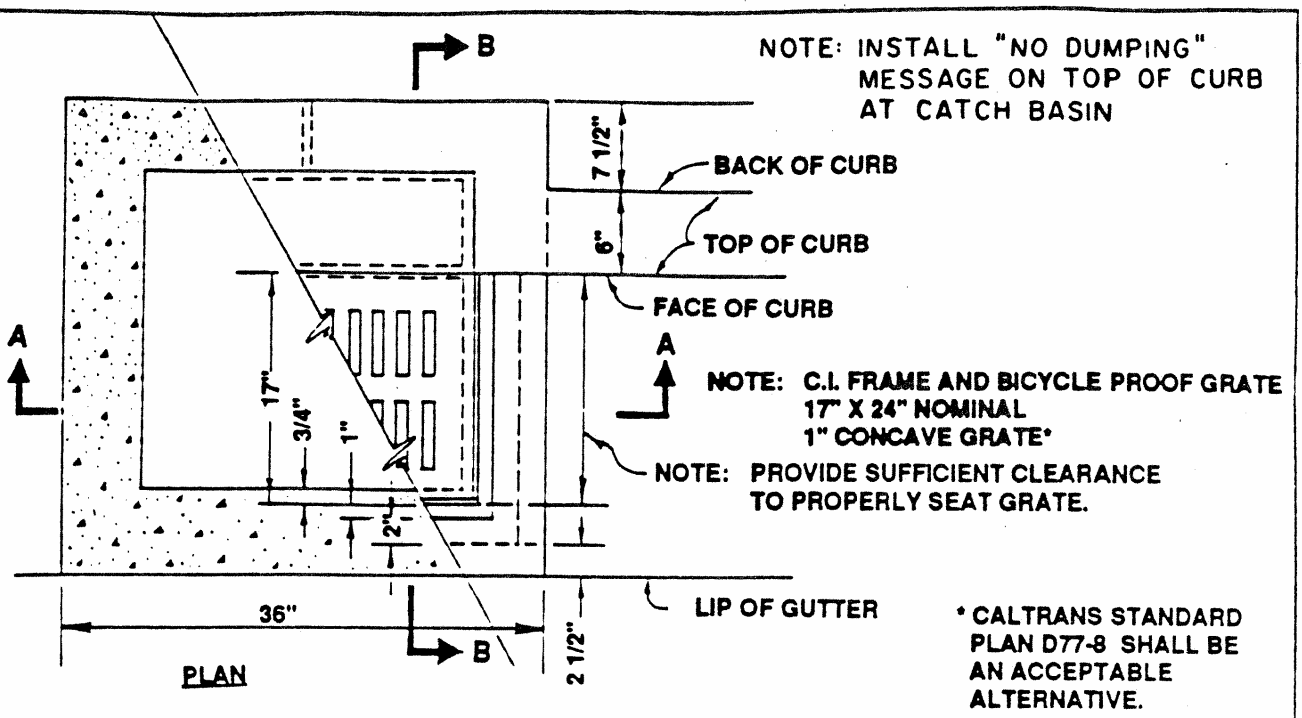
MANHOLE RIM & COVER

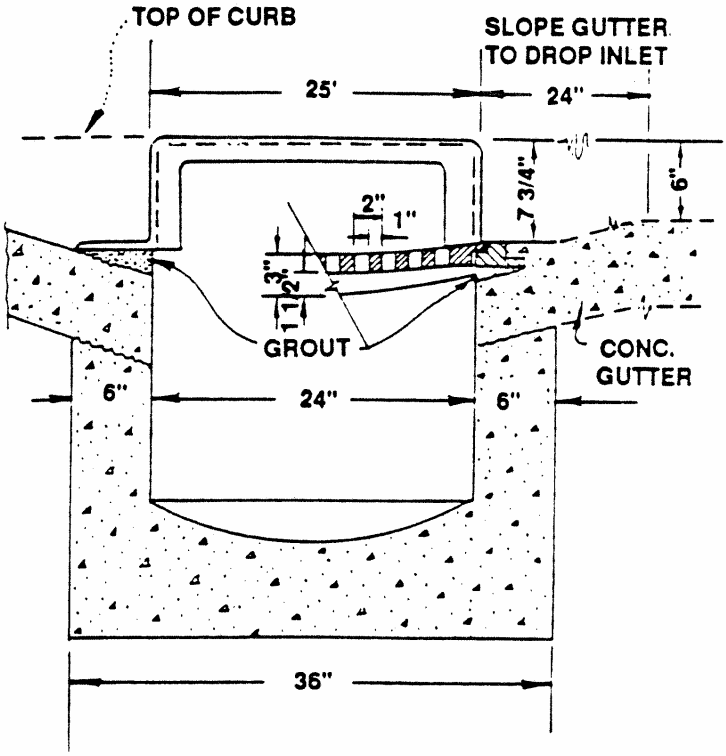
Maria A. Rae
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

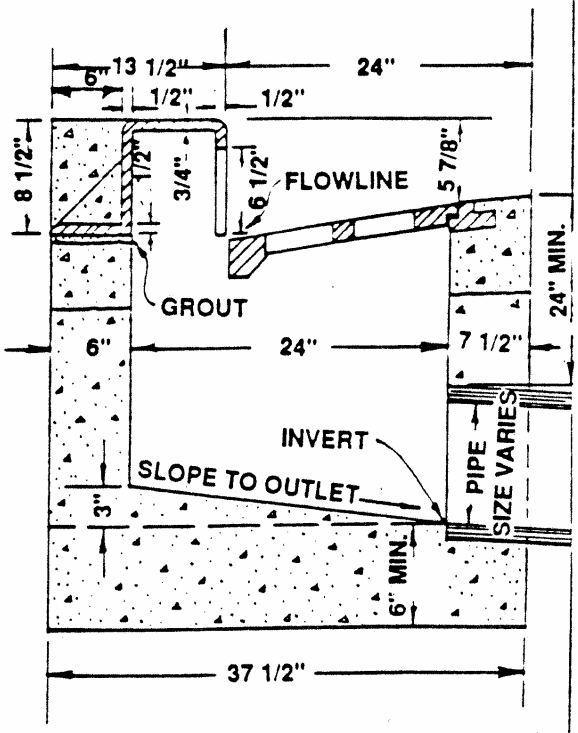
DRWG. 9A

2000 STANDARD DETAILS





SECTION A-A



SECTION B-B

NO SCALE

2000 STANDARD DETAILS

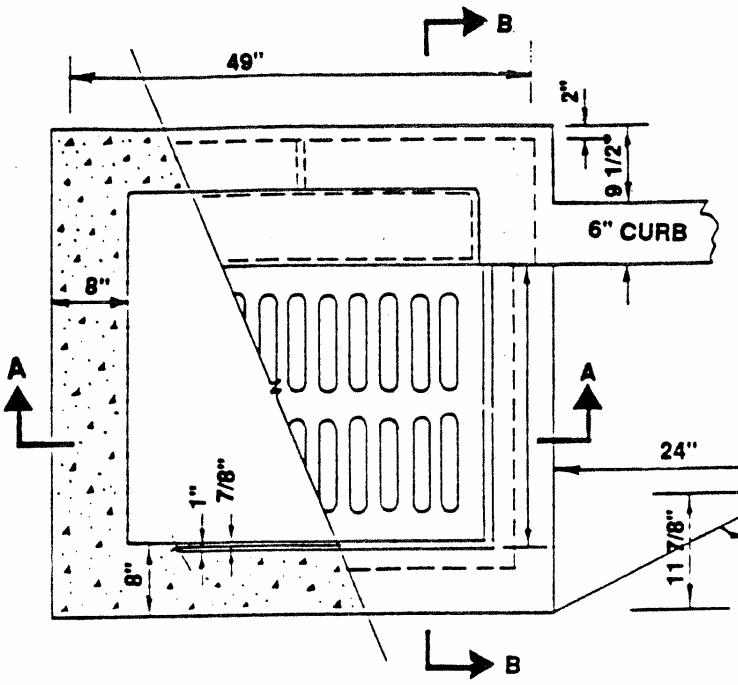
24" CURB DROP INLET

APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 2000

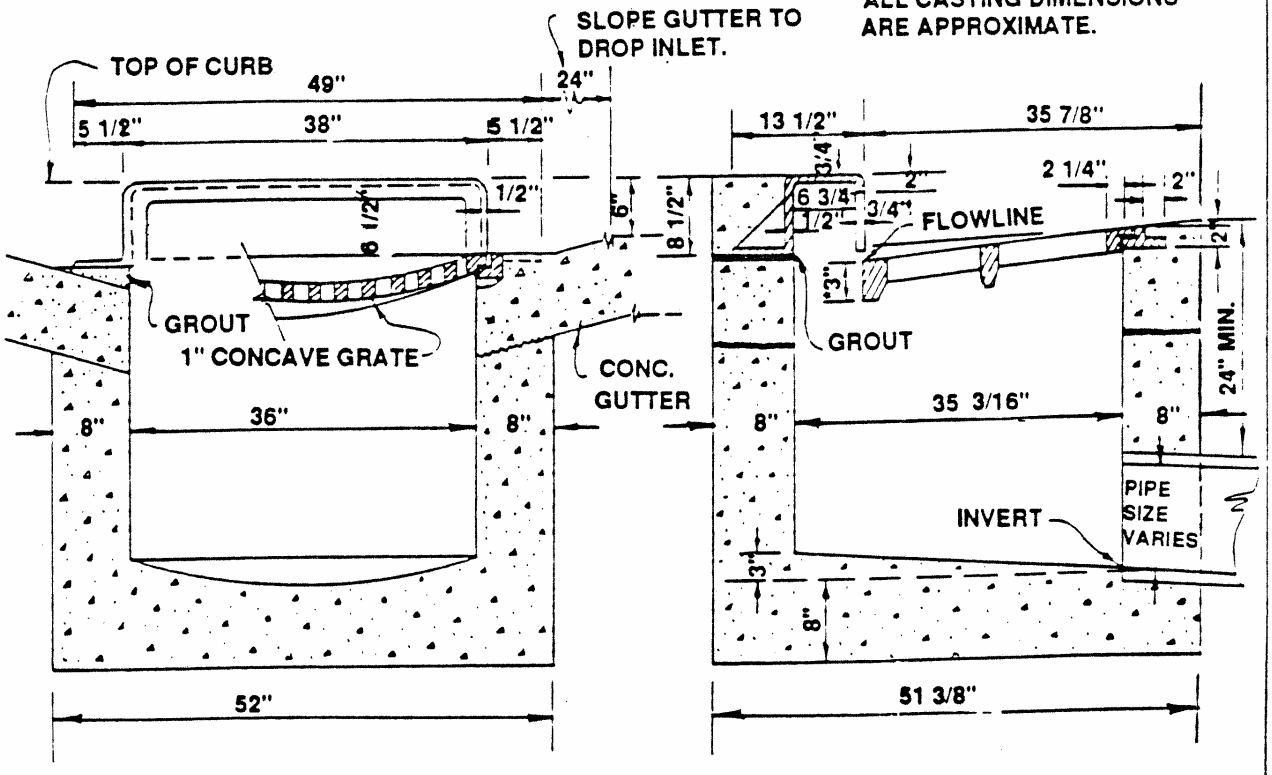
DRWG. 10A



GENERAL NOTES:

1. FRAME AND GRATING TO BE OF CAST IRON (PHOENIX P6002A OR EQUAL), OR HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A-123.
2. FRAME TO BE SET IN CEMENT MORTAR. GRATES SHALL BE BICYCLE PROOF. (CALTRANS STANDARD PLAN D77-B SHALL BE AN ACCEPTABLE ALTERNATE.
3. INSTALL "NO DUMPING" MESSAGE AT TOP OF CURB AT CATCH BASIN

* ALL CASTING DIMENSIONS ARE APPROXIMATE.



SECTION A-A

SECTION B-B

36" CURB DROP INLET

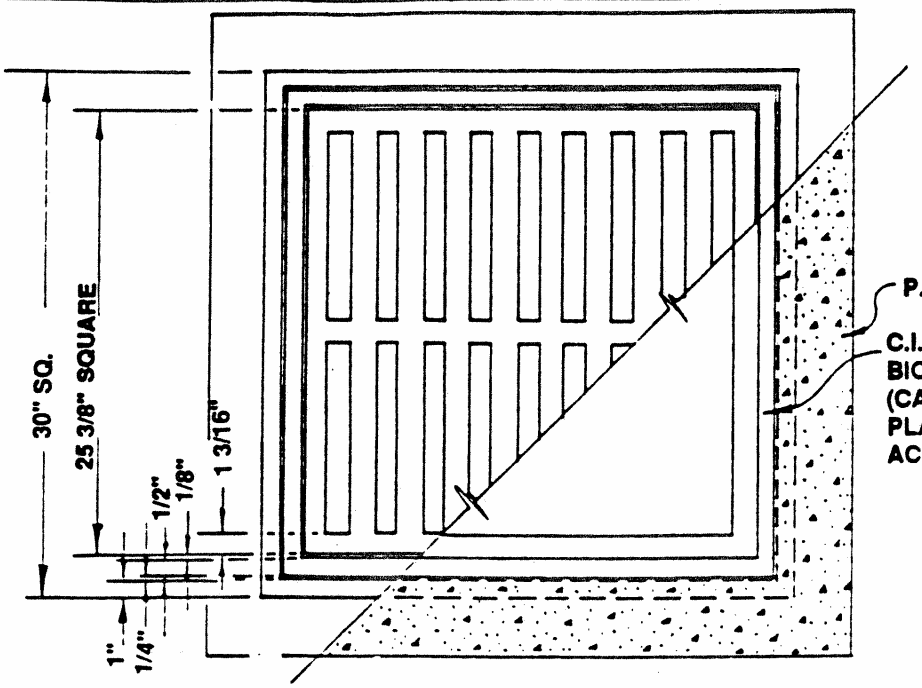
APPROVED BY:

DATE: JUNE 30, 1991

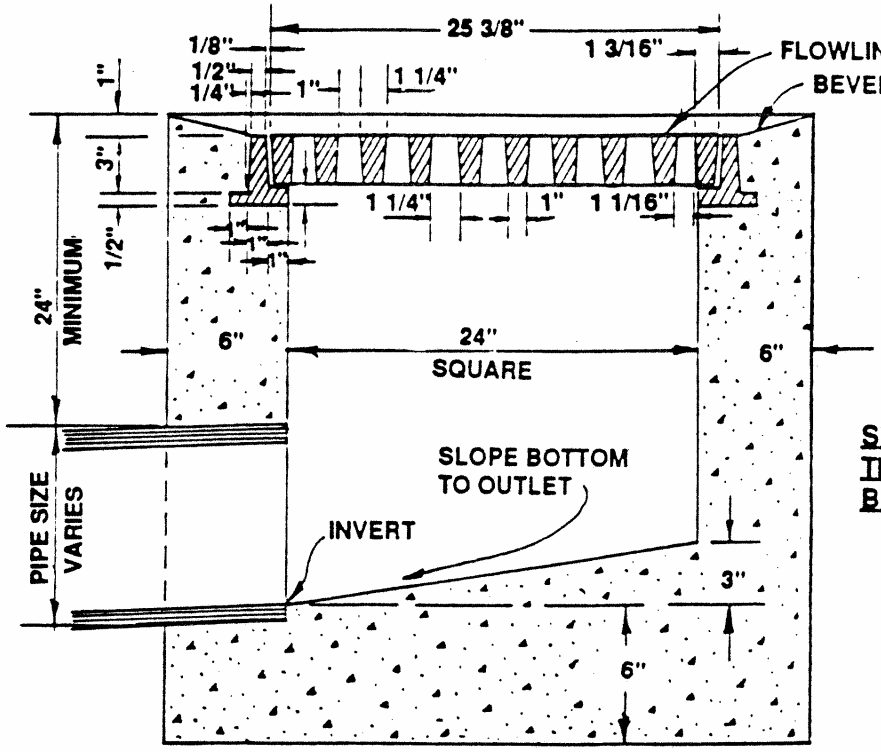
REV. DATE: JULY 2000

DRWG. 11A

2000 STANDARD DETAILS



PLAN



SECTION THROUGH BASIN

NOTE: INSTALL "NO DUMPING" MESSAGE IMMEDIATELY ADJACENT TO DROP INLET

2000 STANDARD DETAILS

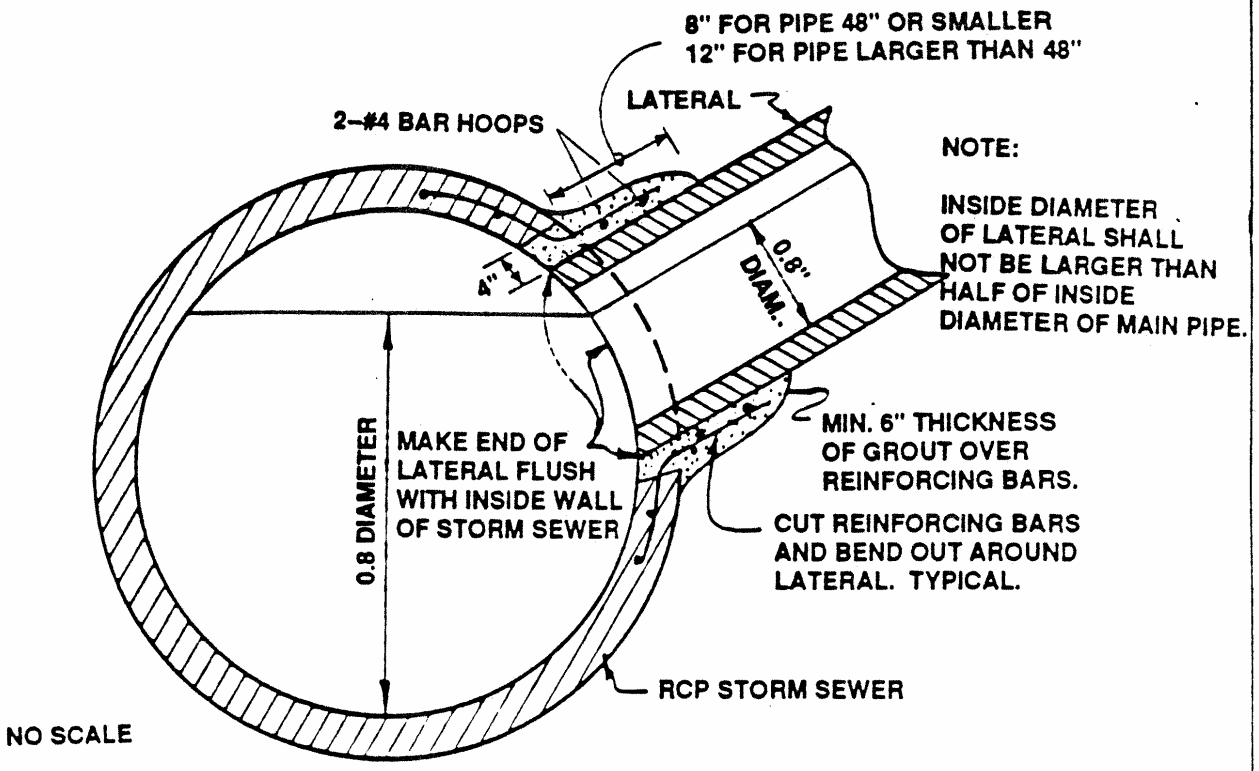
24" FLAT GRATE DROP INLET

APPROVED BY:

DATE: JUNE 30, 1991

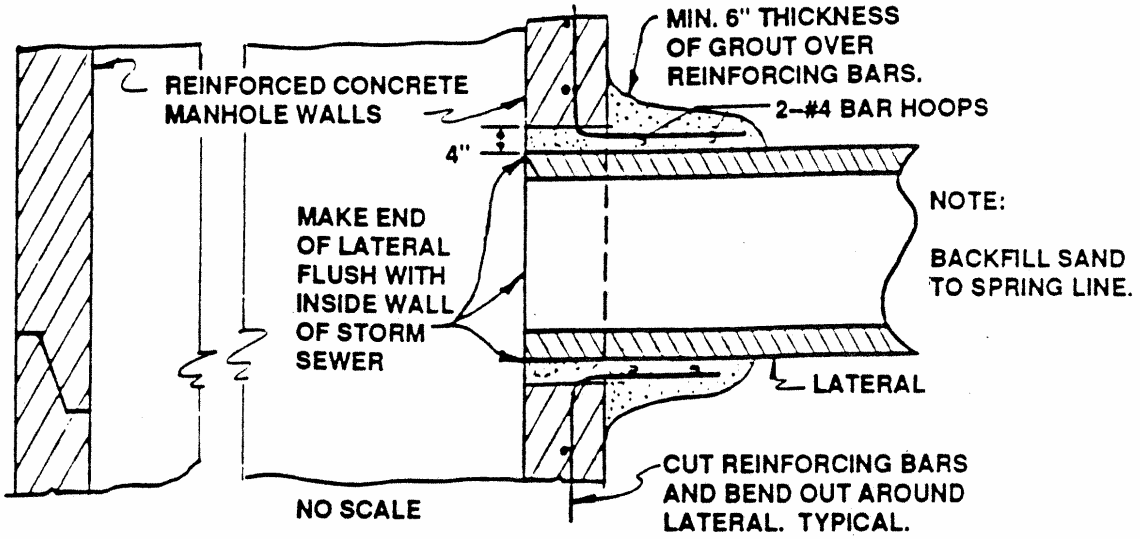
REV. DATE: JULY 2000

DRWG. 12A



CONNECTION TO REINFORCED CONCRETE PIPE

36" RCP AND LARGER



STANDARD CONNECTION TO MANHOLE WALLS

STANDARD CONNECTION TO MANHOLE WALLS, AND REINFORCED CONCRETE PIPE

CITY OF SUNRISE FLORIDA

APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 2000

DRWG. 13A

2000 STANDARD DETAILS

CLEANOUT TO BE INSTALLED AT RIGHT-OF-WAY LINE. SHOW "SEWER" ON THE COVER.

PVC OR ABS PLUG OR CAP
(CAP SHALL BE TREATED W/ANTI- SEIZE COMPOUND)

CHRISTY G-5 OR EQUAL (PAVED AREAS) OR CHRISTY F-8 (LANDSCAPED AREAS)

PVC OR ABS SCH. 40

PLUG DETAIL

ALTERNATE:

IN LIEU OF Y TAPPING SADDLE, IT IS PERMISSIBLE TO MAKE A DIRECT TAP TO MAIN USING "TAP-TITE" CONNECTION OR APPROVED EQUAL.

VCP, SDR 35, PVC OR ABS SCH.40
(PVC SHALL BE COMPATIBLE W/ABS LATERALS)

2'-2"

TREATED BASE ROCK OR PROCESSED MISC. BASE (95% COMPACTION)

MAKE CONNECTION NO CLOSER THAN 12" TO EITHER BELL OR SPIGOT.

CLEANOUT
1"=2'-0"

6" HUB CLEARANCE EACH SIDE OF PIPE AT BELL

MAX. ALLOWABLE DEFLECTION FROM RIGHT ANGLE PRODUCES 8' OFFSET @ ℄

45°

SIDE OF TRENCH EXCA.

8'-0"

SEWER LATERAL

SEWER MAIN

LETTER "S" TO BE PLACED ON TOP OF CURB OVER LATERAL (2" HIGH).

FACE OF CURB

PLAN

SEE CLEANOUT DETAIL ABOVE

SIDEWALK

FINISHED PAVEMENT GRADE

FLUSH W/SIDEWK.

MIN. DEPTH OF COVER BELOW TOP OF CURB.

4'-6"

MIN. GRADE 1/4"/FT

ELEVATION

INSTALL PLUG IF CONNECTION IS DEFERRED

3" MIN. GRANULAR BEDDING UNDER SEWER LATERAL.

SEWER LATERAL

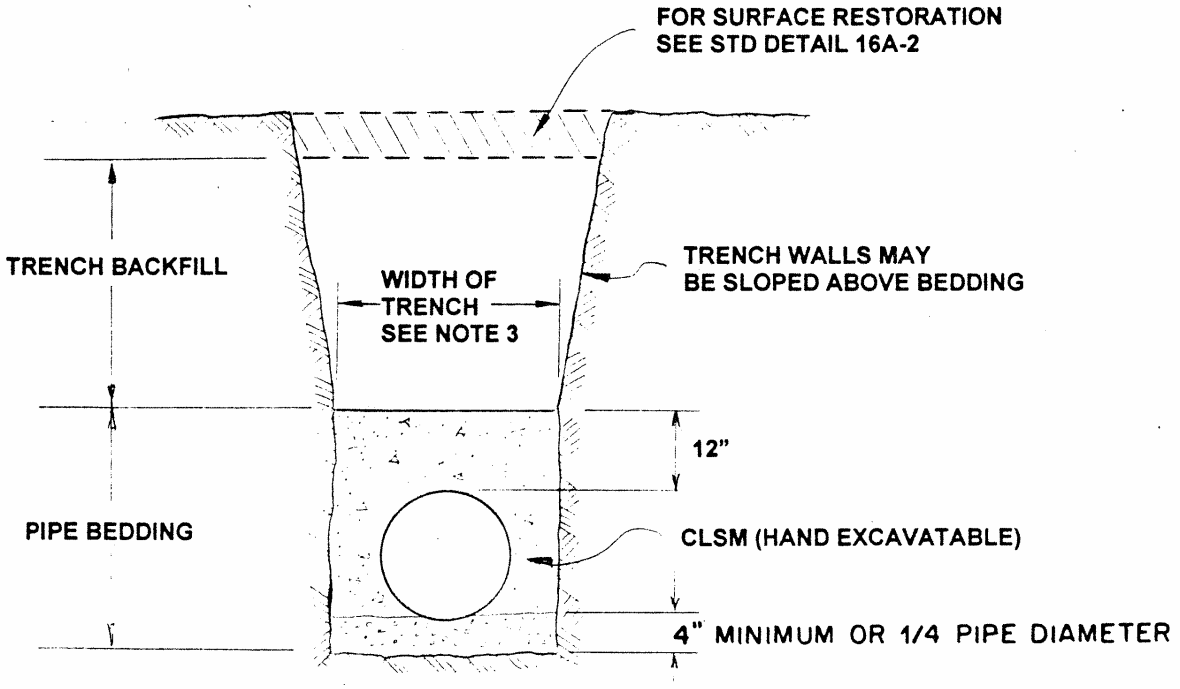
CITY OF SUNNYVALE CALIFORNIA

Myron A. Rae
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

DWG. 15A

2000 STANDARD DETAILS



NOTES:

1 THIS DETAIL APPLIES TO ALL PIPES 6" NOM. DIAMETER AND GREATER.

2 TRENCH WIDTH SHALL BE NOT MORE THAN 18" WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE. THERE SHALL BE A MINIMUM OF 6" CLEARANCE ON EACH SIDE OF THE PIPE AT THE LARGEST OUTSIDE DIAMETER.

3 PIPE SHALL BE BEDDED FROM BELOW THE BOTTOM OF THE PIPE TO 12" ABOVE THE TOP OF THE PIPE.

4 BEDDING MATERIAL SHALL BE PROCESSED MISC. BASE BELOW THE PIPE, AND HAND EXCAVATABLE, CONTROLLED LOW STRENGTH MATERIAL (CLSM) FROM THE BOTTOM OF THE PIPE TO 12" ABOVE THE TOP OF THE PIPE.

5 CONTROLLED LOW STRENGTH MATERIAL SHALL HAVE A MINIMUM/MAXIMUM 28 DAY COMPRESSIVE STRENGTH OF 100 PSI / 200 PSI RESPECTIVELY.

6 TRENCH BACKFILL SHALL BE EITHER CLSM OR PROCESSED MISC. BASE AT THE CONTRACTOR'S OPTION. NATIVE MATERIAL, SAND OR "PEA GRAVEL" TYPE MATERIALS ARE NOT PERMITTED AS BACKFILL.

7 BACKFILL COMPACTION REQUIREMENTS FOR PROCESSED MISC. BASE TRENCH BACKFILL ARE:

- A 95% RELATIVE COMPACTION WITHIN STREET RIGHT-OF-WAY.
- B 90% RELATIVE COMPACTION OUTSIDE STREET RIGHT-OF-WAY.
- C COMPACTION BY WATER JETTING IS NOT PERMITTED.

TYPICAL TRENCH SECTION

CITY OF SUNNYVALE CALIFORNIA

Marvin A. Rose

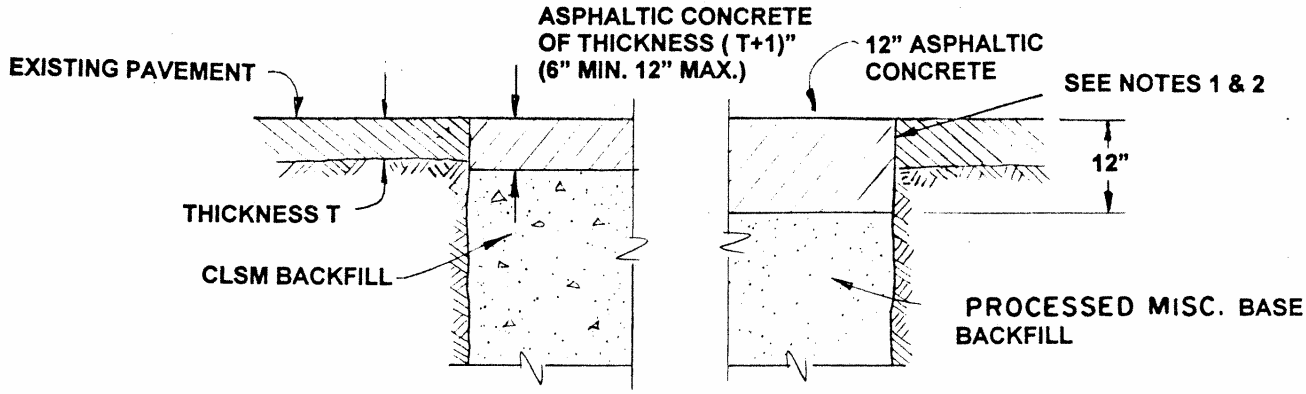
APPROVED BY:

DATE

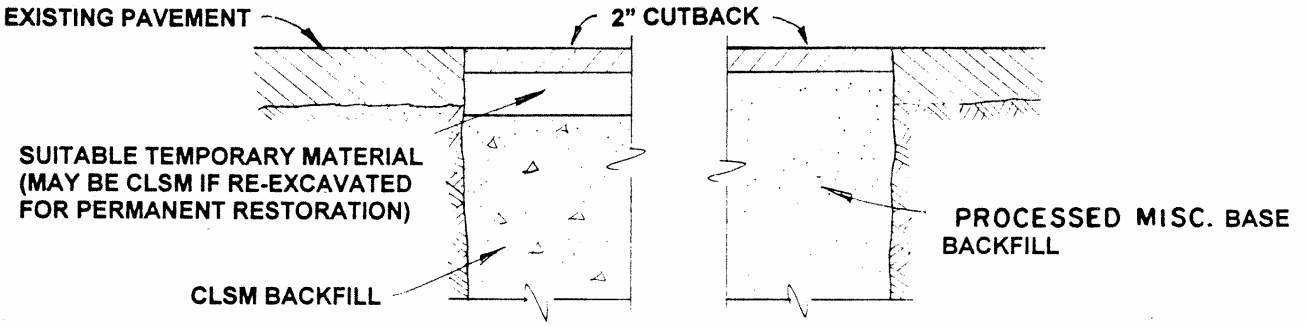
REV. DATE JULY 2000

16A-1

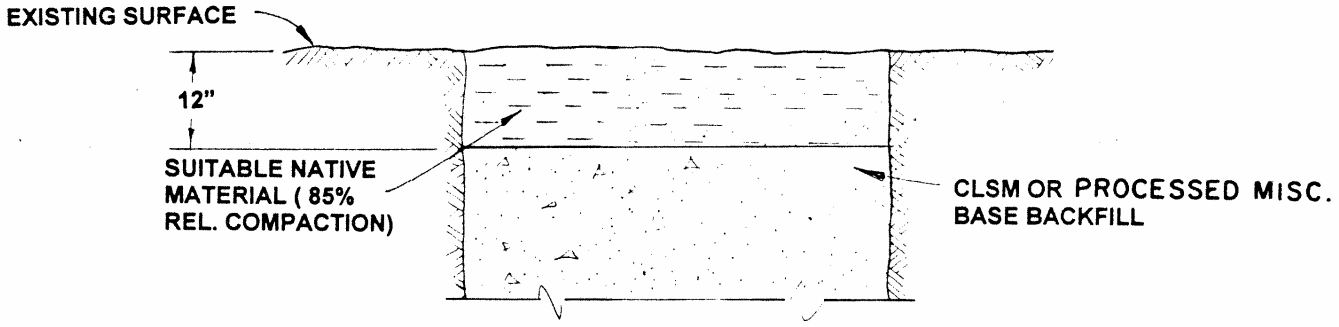
2000 STANDARD DETAILS



PERMANENT RESTORATION IN EXISTING PAVEMENT SURFACES (SEE NOTE 5)



TEMPORARY RESTORATION IN EXISTING PAVEMENT SURFACES



RESTORATION IN EXISTING NON-PAVED SURFACES

NOTES:

1. FOR EXISTING PAVEMENT, SAWCUT EDGE BEFORE EXCAVATION
2. APPLY TACK COAT TO CUT EDGE OF EXISTING PAVEMENT.
3. FOR PAVED SURFACES FOR WHICH THE PERMANENT SURFACING CANNOT BE INSTALLED BEFORE RETURNING THE PAVEMENT TO USE BY THE PUBLIC, A TEMPORARY SURFACING OF 2" (MIN) OF CUTBACK SHALL BE INSTALLED, FLUSH WITH THE ADJACENT PAVEMENT, UNTIL SUCH TIME AS THE PERMANENT SURFACING IS INSTALLED. TEMPORARY SURFACING SHALL BE CONSTRUCTED FLUSH WITH THE ADJACENT PAVEMENT AND SHALL BE MAINTAINED FLUSH.
4. TEMPORARY SURFACING SHALL NOT BE USED FOR MORE THAN TWO WEEKS.
5. SEE STD. DETAIL 16 A-3 (SHEET 2 OF 2) WHICH MAY MODIFY SOME OF THESE DETAILS, DEPENDING ON LOCATION OF THE TRENCH RELATIVE TO OTHER FEATURES.

TYPICAL TRENCH SURFACE RESTORATION

1 OF 2

CITY OF SUNNYVALE CALIFORNIA

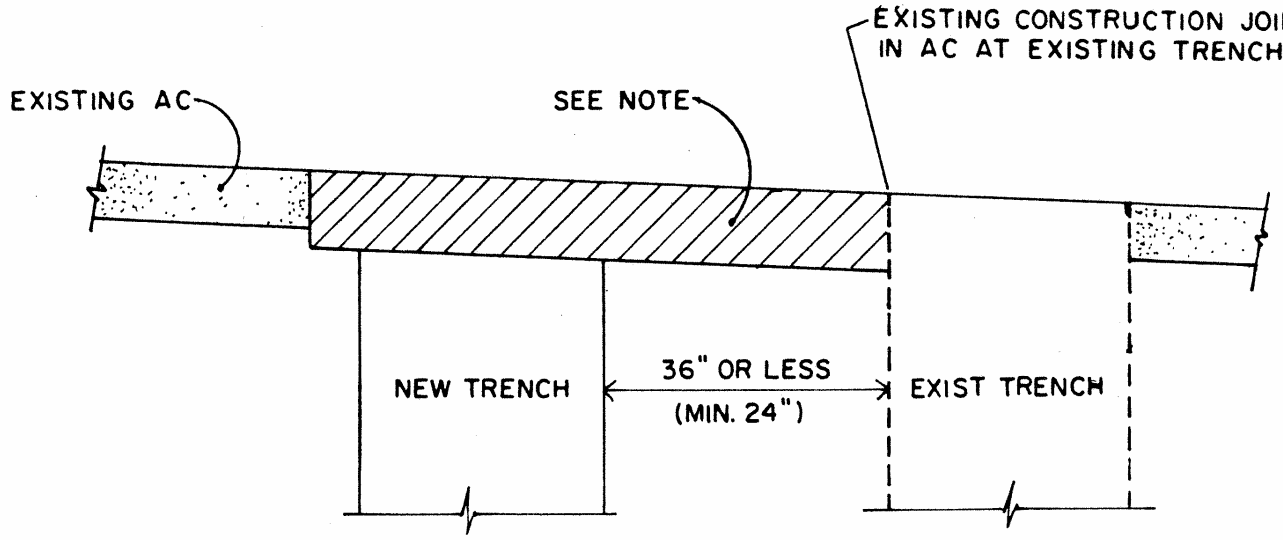
Mari A. Rose

DATE JULY 2000

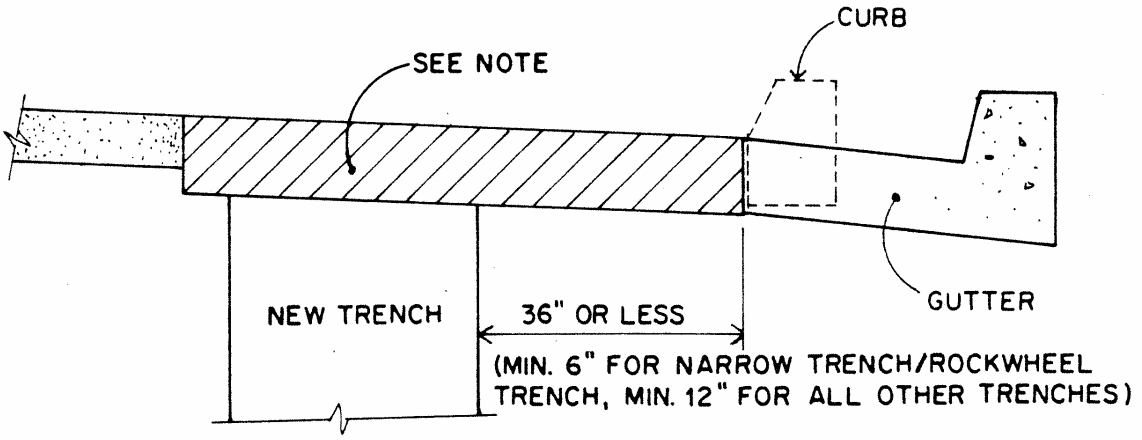
REV. DATE

16A-2

2000 STANDARD DETAILS



DETAIL 1 FOR TRENCH CONSTRUCTION 36" OR LESS FROM EXISTING TRENCH



DETAIL 2 FOR TRENCH CONSTRUCTION W/IN 36" OF GUTTER (OR CURB)

NOTE: STD DETAILS 16A-2 & 16A-5 (FOR DIFFERENT TRENCH TYPES) SHOW RESTORED PAVEMENT DETAILS. THIS STD DETAIL MODIFIES THE WIDTH OF THE PAVEMENT RESTORATION.

TYPICAL TRENCH SURFACE RESTORATION

2 OF 2

CITY OF SUNNYVALE CALIFORNIA

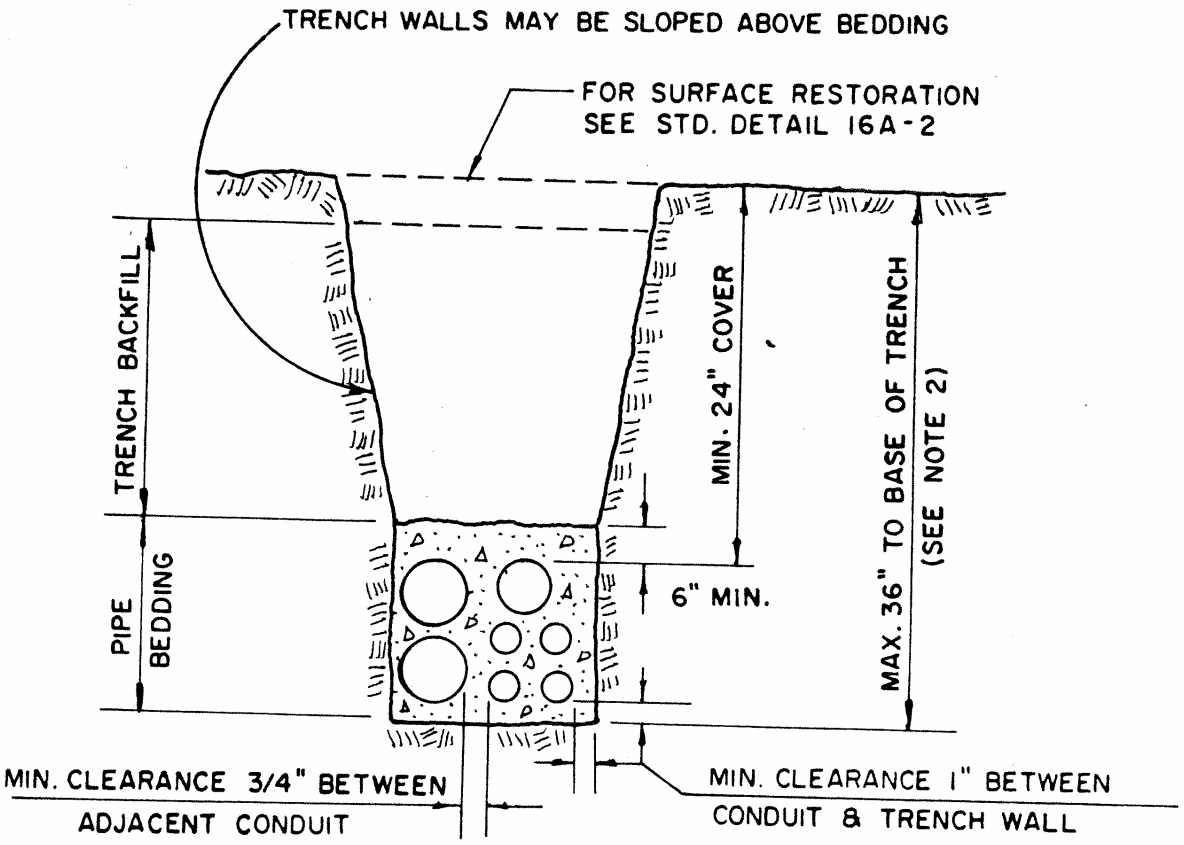
APPROVED

DATE JULY 2000

REV. DATE

DRWG. 16A-3

2000 STANDARD DETAILS



NOTES:

1. THIS DETAIL APPLIES FOR MULTIPLE UTILITY CONDUITS.
2. FOR TRENCH DEPTHS GREATER THAN 36", OBTAIN CITY APPROVAL.
3. CONDUIT SHALL BE BEDDED FROM THE BOTTOM OF THE TRENCH TO 6" ABOVE THE UPPERMOST CONDUIT.
4. BEDDING MATERIAL SHALL BE HAND EXCAVATABLE CONTROLLED LOW STRENGTH MATERIAL (CLSM).
5. CLSM SHALL HAVE A MINIMUM/MAXIMUM 28 DAY COMPRESSIVE STRENGTH OF 100 PSI/200 PSI.
6. TRENCH BACKFILL SHALL BE EITHER CLSM OR PROCESSED MISC. BASE AT THE CONTRACTOR'S OPTION. NATIVE MATERIAL, SAND OR "PEA GRAVEL" TYPE MATERIALS ARE NOT PERMITTED AS BACKFILL.
7. COMPACTION REQUIREMENTS FOR PROCESSED MISC. BASE TRENCH ARE:
   A 95% RELATIVE COMPACTION WITHIN STREET RIGHT-OF-WAY.
   B 90% RELATIVE COMPACTION OUTSIDE STREET RIGHT-OF-WAY

TYPICAL MULTIPLE UTILITY CONDUIT TRENCH SECTION

CITY OF SUNNYVALE CALIFORNIA

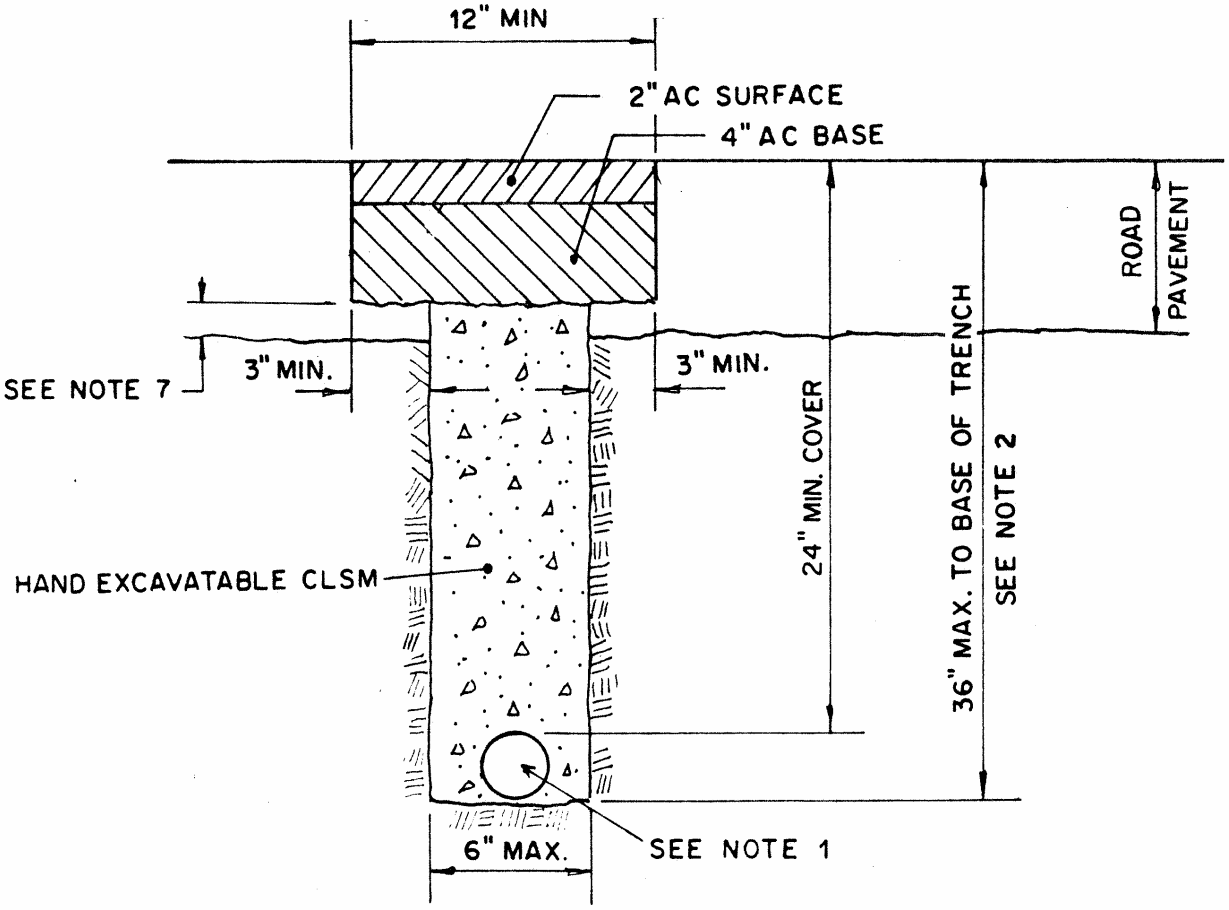
APPROVED

DATE JULY 14, 2000

REV. DATE

DRWG 16A-4

2000 STANDARD DETAILS



NOTES:

1. SINGLE OR MULTIPLE CONDUITS MAY BE USED. MINIMUM LATERAL CLEARANCE SHALL BE 1" BETWEEN CONDUITS OR CONDUITS/WALL OF TRENCH. MINIMUM VERTICAL CLEARANCE BETWEEN CONDUITS SHALL BE 3/4". CONDUIT(S) MAY REST ON THE BOTTOM OF THE TRENCH.
2. FOR TRENCH DEPTHS GREATER THAN 36", OBTAIN CITY APPROVAL.
3. THE TRENCH SHALL BE BACKFILLED WITH HAND EXCAVATABLE CONTROLLED LOW STRENGTH MATERIAL (CLSM).
4. CLSM SHALL HAVE A MIN./MAX. 28 DAY COMPRESSIVE STRENGTH OF 100 PSI/ 200 PSI RESPECTIVELY.
5. 4" BASE ASPHALTIC CONCRETE SHALL BE 3/4" MAXIMUM (MEDIUM)
6. 2" SURFACE ASPHALTIC CONCRETE SHALL BE 1/2" MAXIMUM (MEDIUM)
7. IF 2" OR LESS OF AC REMAINS, TAKE THE AC PLUG FULL DEPTH OF THE EXISTING AC THICKNESS.
8. SEE STD. DETAIL 16 A-3 (SHEET 2 OF 2) WHICH MAY MODIFY THE PAVEMENT RESTORATION DETAIL, DEPENDING ON LOCATION OF THE TRENCH RELATIVE TO OTHER FEATURES.

TYPICAL NARROW TRENCH/ROCKWHEEL UTILITY CONDUIT TRENCH DETAIL

1 OF 2

CITY OF SUNNYVALE CALIFORNIA

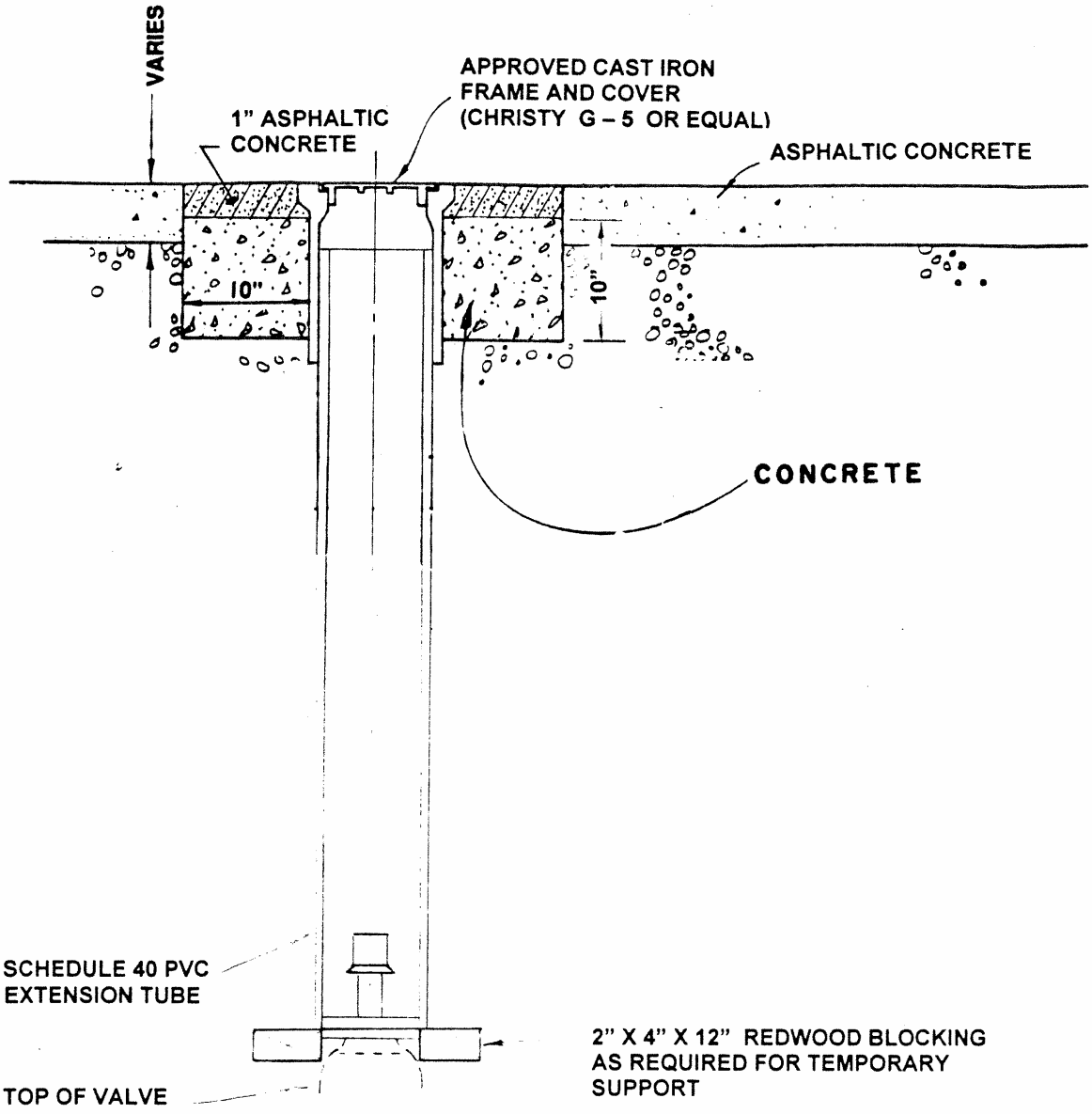
APPROVED

DDATE JULY 14, 2000

REV. DATE

DRWG. 16A-5

2000 STANDARD DETAILS



NOTE:

1. PLACE EXTENSION KEY INSIDE VALVE BOX EXTENSION WHEN VALVE KEY DEPTH IS GREATER THAN 10'-0"
2. LID CASTING FOR POTABLE WATER SYSTEM SHALL INCLUDE DESIGNATION "WATER"
3. LID CASTING FOR RECYCLED WATER SYSTEM SHALL INCLUDE DESIGNATION "RECYCLED WATER"

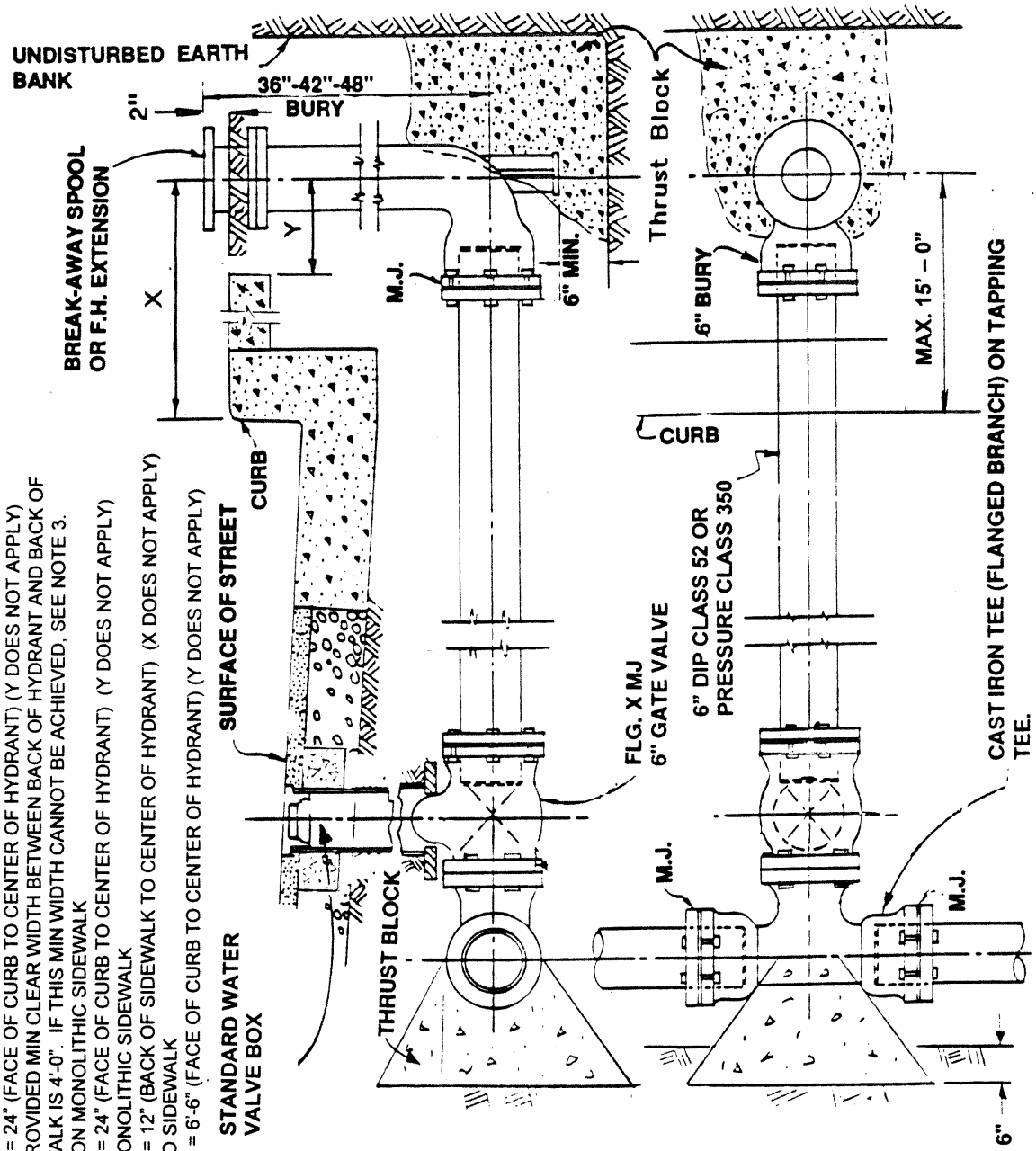
WATER VALVE BOX INSTALLATION

Marvin A. Rose
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

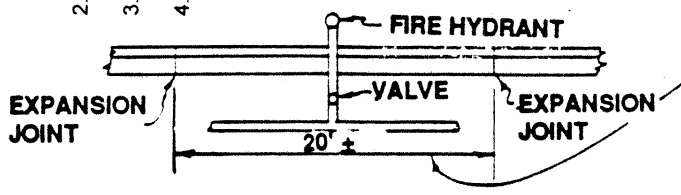
DRWG. 1B

2000 STANDARD DETAILS



HYDRANT LOCATION NOTES

1. EXTRA WIDE MONOLITHIC SIDEWALK
   X = 24" (FACE OF CURB TO CENTER OF HYDRANT) (Y DOES NOT APPLY)
   PROVIDED MIN CLEAR WIDTH BETWEEN BACK OF HYDRANT AND BACK OF WALK IS 4'-0". IF THIS MIN WIDTH CANNOT BE ACHIEVED, SEE NOTE 3.
2. NON MONOLITHIC SIDEWALK
   X = 24" (FACE OF CURB TO CENTER OF HYDRANT) (Y DOES NOT APPLY)
3. MONOLITHIC SIDEWALK
   Y = 12" (BACK OF SIDEWALK TO CENTER OF HYDRANT) (X DOES NOT APPLY)
4. NO SIDEWALK
   X = 6'-6" (FACE OF CURB TO CENTER OF HYDRANT) (Y DOES NOT APPLY)



NOTE:

LATERAL AND FIRE HYDRANT SHALL BE INSTALLED AND TRENCH BACKFILLED AND COMPACTED IN THIS AREA BEFORE CURB AND GUTTER ARE POURED.

CURB DETAIL AT FIRE HYDRANT LOCATIONS

FIRE HYDRANT ASSEMBLY

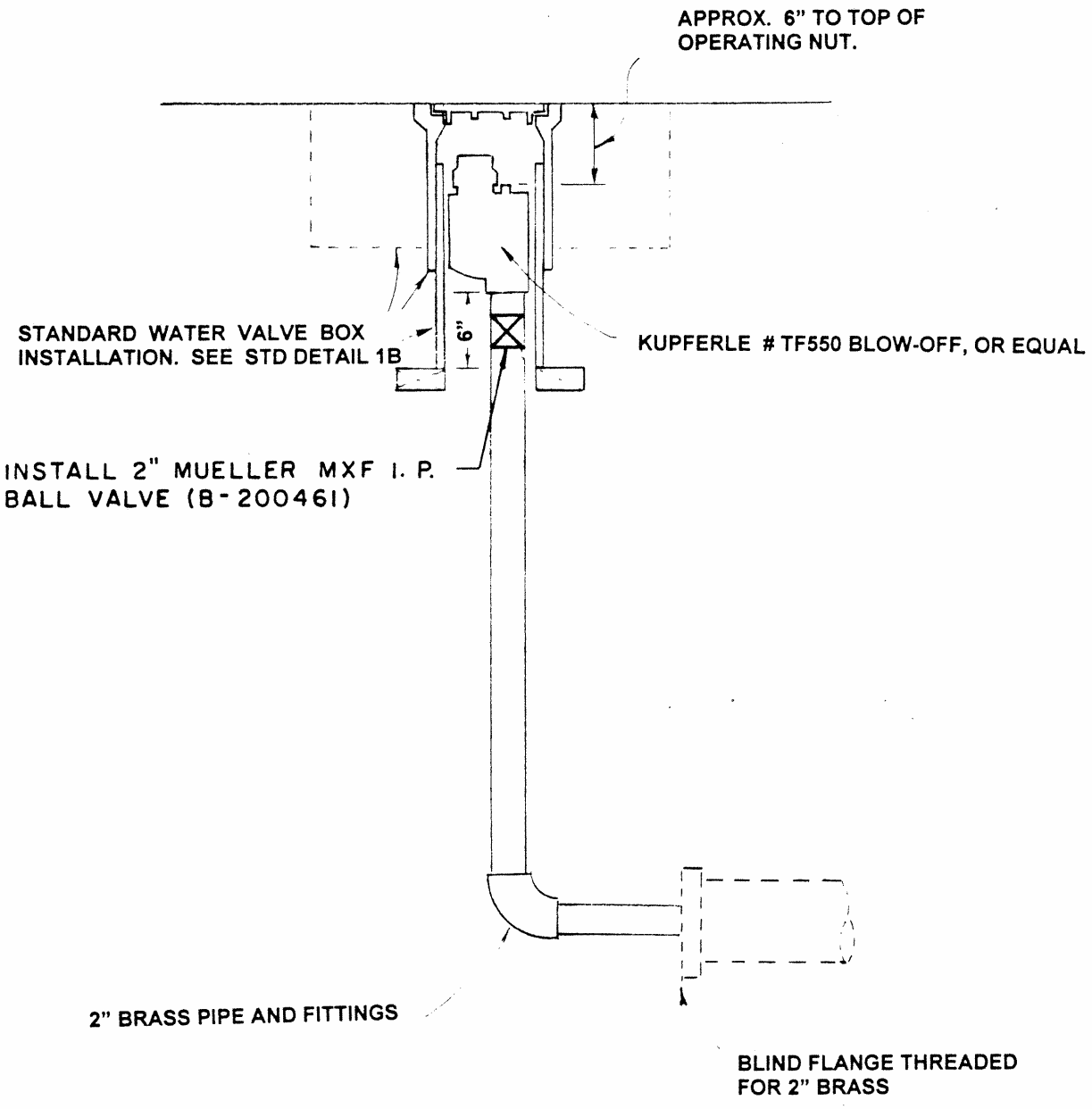
CITY OF SUNNYVALE CALIFORNIA

Marvin A. Rose
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

DRWG. 2B

2000 STANDARD DETAILS



STANDARD BLOW-OFF

CITY OF SUNNYVALE

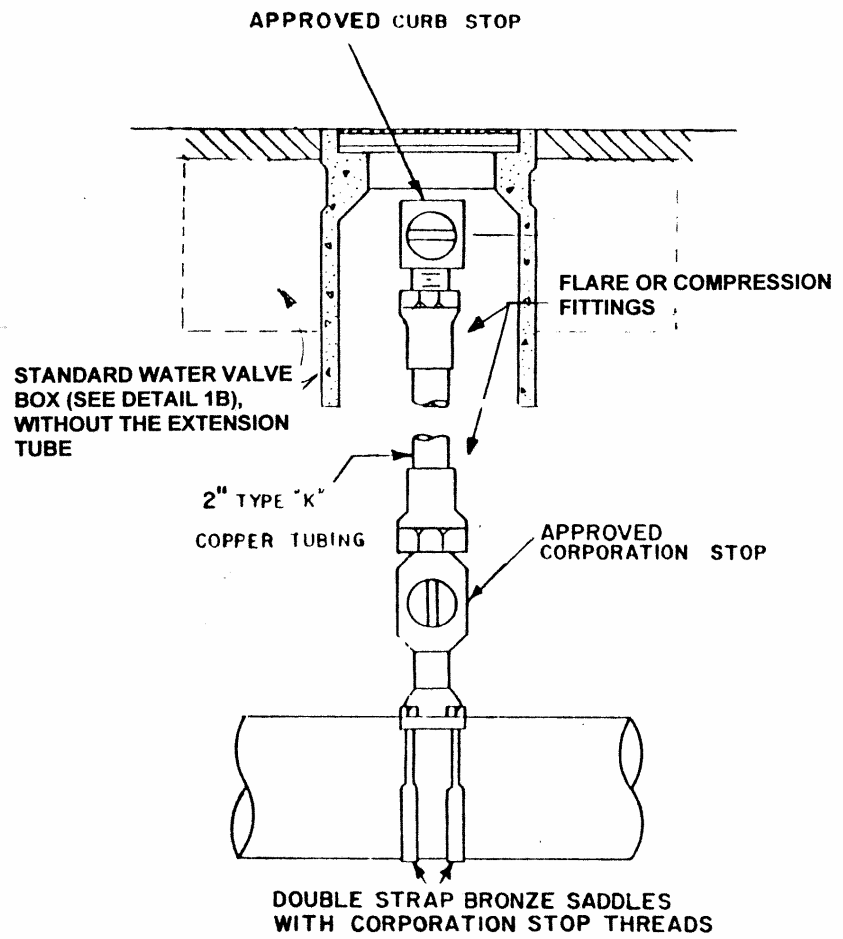
Marvin A. Rose
APPROVED BY

DATE JUNE 30, 1991
REV. DATE JULY 2000

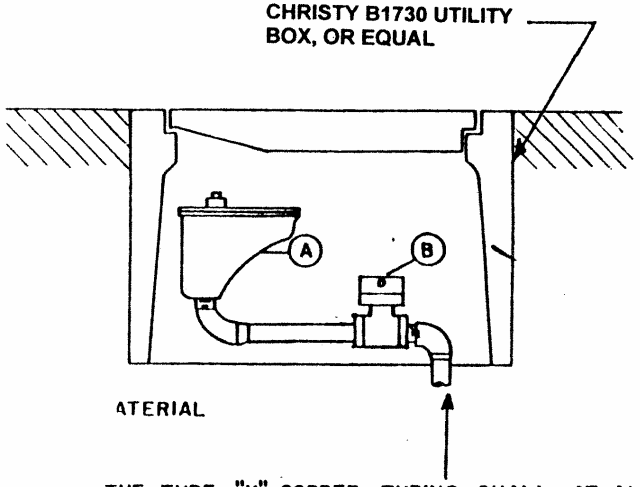
3B

2000 STANDARD DETAILS

STANDARD AIR - RELIEF VALVES



MANUAL AIR RELIEF



THE TYPE "K" COPPER TUBING SHALL AT ALL POINTS BE RISING FROM THE CORPORATION STOP TO THE AIR & VACUUM RELIEF VALVE.

(A) APPROVED AIR RELEASE VALVE

(B) APPROVED CURB STOP

NOTES:

1. PAVEMENT, COLLAR & FOUNDATION AS FOR MANUAL AIR RELIEF.
2. CONNECTION TO WATER MAIN SHALL CONFORM TO STANDARD DETAILS AND SPECIFICATIONS.
3. USE SAME DIAMETER SEAMLESS COPPER TUBING AS REQUIRED SIZE OF AIR & VACUUM RELIEF VALVE.
4. AIR RELIEF VALVE AND CURB STOP SHALL BE PLACED IN BOX SUCH THAT THE WALL OF THE BOX WILL NOT INTERFERE WITH THE INSTALLATION AND REMOVAL OF THE VALVES.

AUTOMATIC AIR & VACUUM VALVE

DATE JUNE 30, 1991
REV. DATE AUGUST, 1997

APPROVED BY

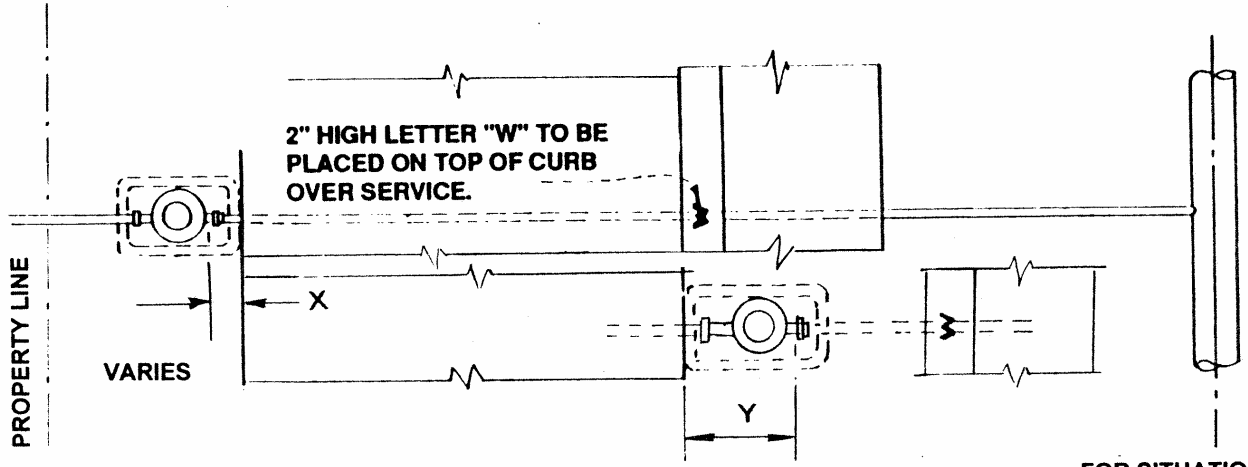
3B-1

REV. JULY 1998

2000 STANDARD DETAILS

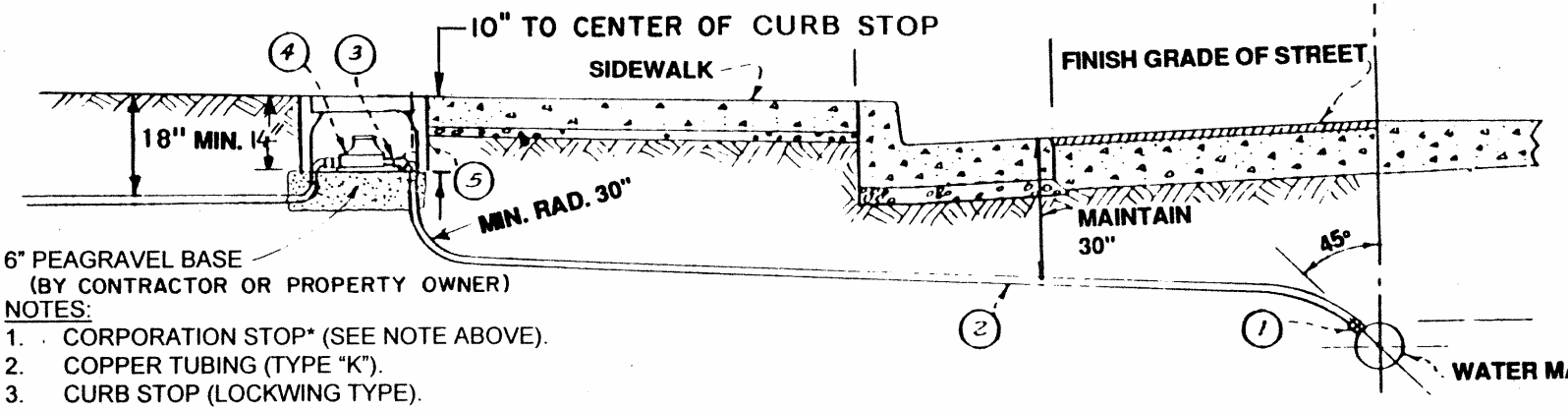
WATER SERVICE CONNECTION FOR METER SIZES

5/8" 3/4" 1" 1-1/2" AND 2"



NOTE: ALL SERVICE CONNECTIONS LARGER THAN 1" TO CAST IRON OR DUCTILE IRON MAINS REQUIRE THE INSTALLATION OF DOUBLE STRAP BRONZE SADDLES WITH MUELLER THREAD. ALL SERVICE CONNECTIONS TO EXISTING ASBESTOS CEMENT PIPE REQUIRE DOUBLE STRAP BRONZE SADDLES.

FOR SITUATIONS WHERE THERE IS INSUFFICIENT ROOM BETWEEN BACK OF SIDEWALK AND PROPERTY LINE, INSTALL METER BOX IN SIDEWALK AS DIRECTED BY ENGINEER.



NOTES:

1. CORPORATION STOP* (SEE NOTE ABOVE).
2. COPPER TUBING (TYPE "K").
3. CURB STOP (LOCKWING TYPE).
4. WATER METER*.
5. METER BOX*.
6. EXCAVATE FOR METER BOX AND PLACE PEAGRAVEL BASE BEFORE CITY INSTALLATION OF METER BOX.
7. FOR MONOLITHIC OR NO SIDEWALK LOCATIONS USE DETAIL WITH "X" DIMENSION. FOR NON-MONOLITHIC SIDEWALK, USE DETAIL WITH "Y" DIMENSION.

* CITY WILL PERFORM LIVE TAP AND WILL FURNISH AND INSTALL METER AND BOX UPON PAYMENT OF FEE.

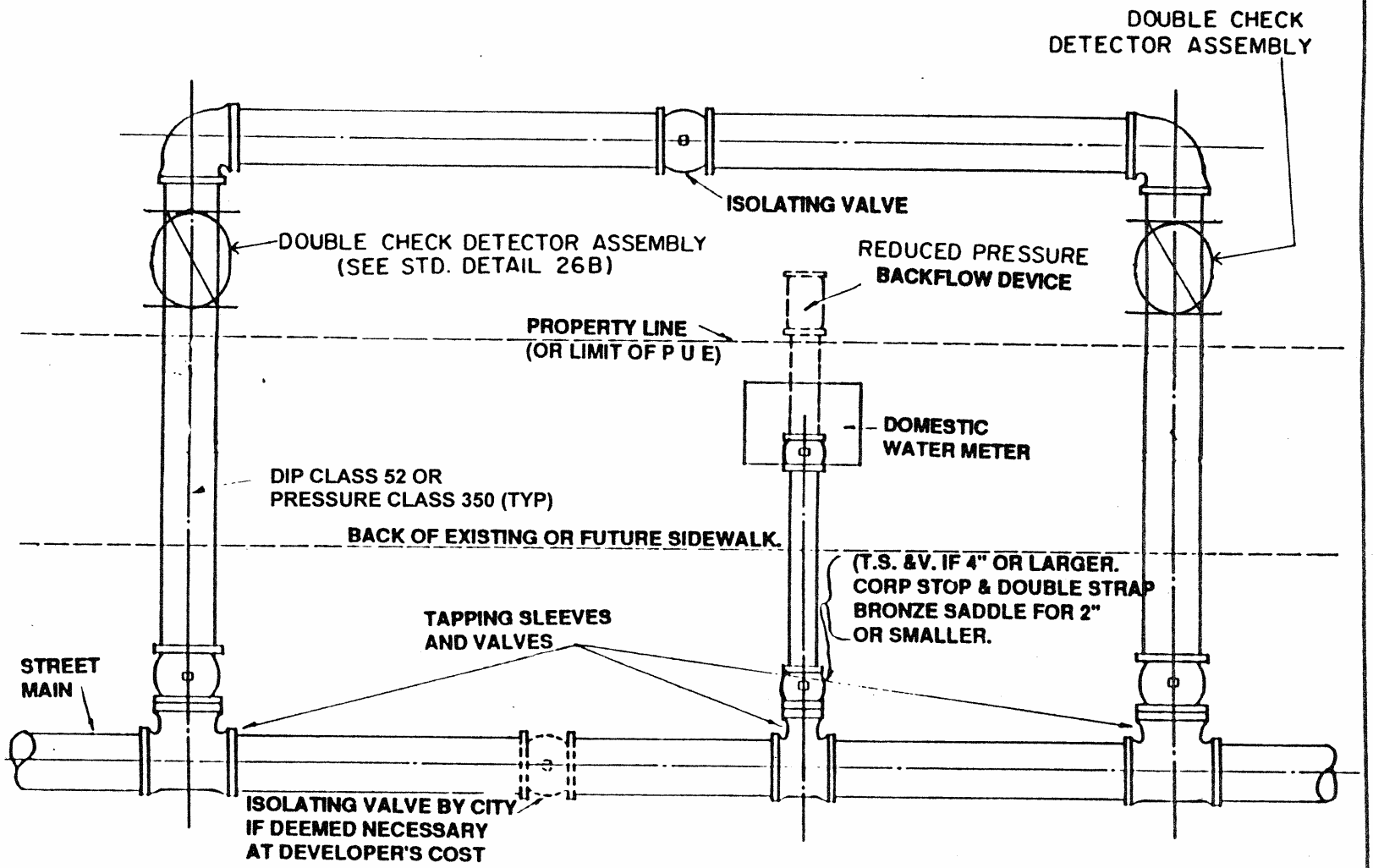
METER SIZE	5/8"	3/4"	1"	1½"	2"
X *	6"	6"	7"	7"	9"
Y	14"	14"	17"	20"	26"
METER BOX EXCAV. SIZE (WxL) (in x in)	(18x24)	(18x24)	(20x30)	(20x30)	(24x36)

* WHERE NO SIDEWALK, MEASURE "X" FROM BACK OF CURB

DATE: JUNE 30, 1991
REV. DATE: JULY 2000
APPROVED BY:
DRWG. 4B

2000 STANDARD DETAILS

FIRE SERVICE LOOP WITH SEPARATE DOMESTIC SERVICE



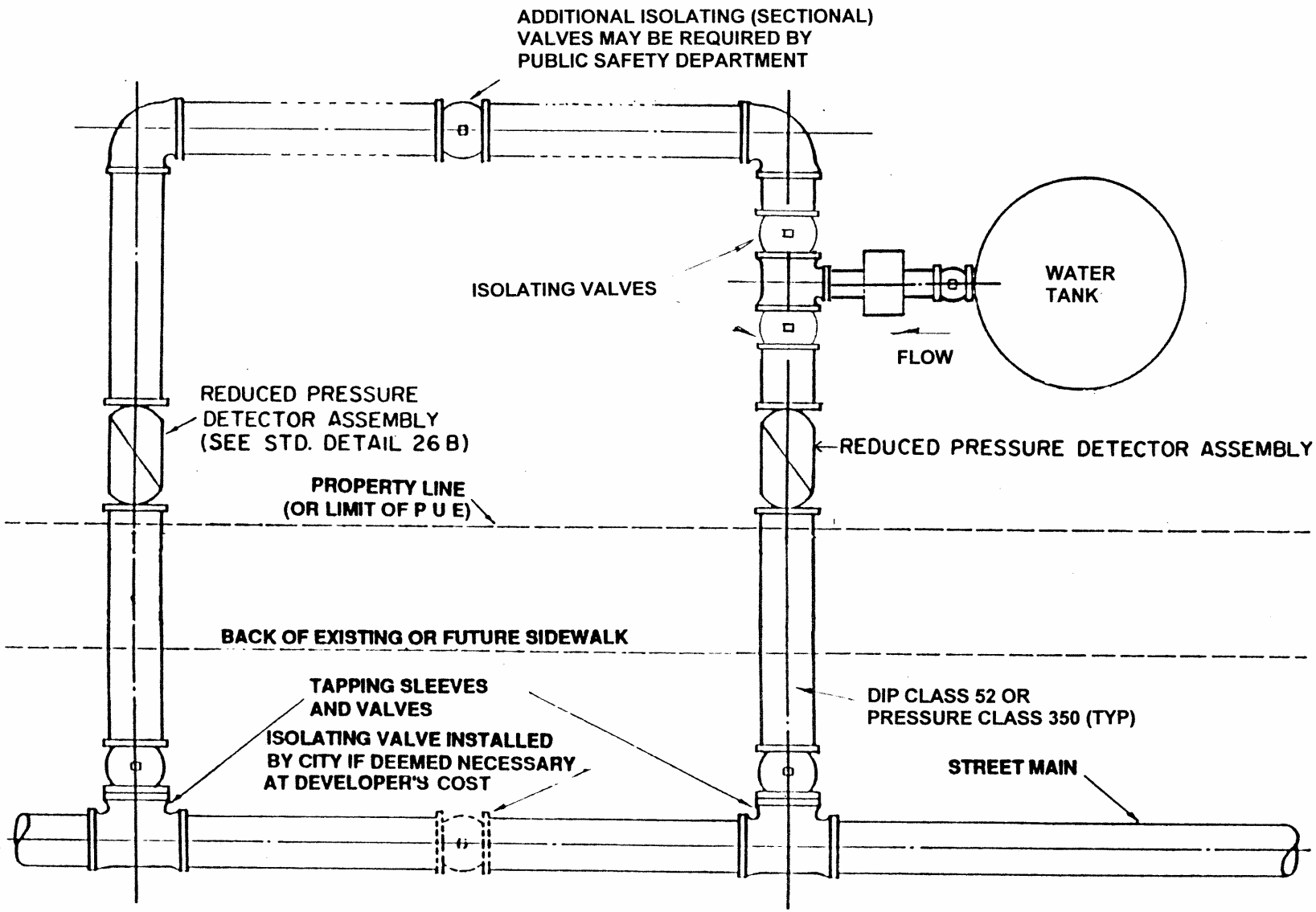
NOTE: AN APPROVED BACKFLOW DEVICE REQUIRED ON THE FIRE LOOP AND ON THE DOMESTIC SYSTEM

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

APPROVED BY:

DRWG. 5B

FIRE SERVICE LOOP
WITH FIRE PUMP AND TANK



DATE: JUNE 30, 1991
REV. DATE: JULY 2000

APPROVED BY:

DETAIL 6B

FIRE SERVICE CONNECTION
TO CITY FIRE HYDRANT LATERAL

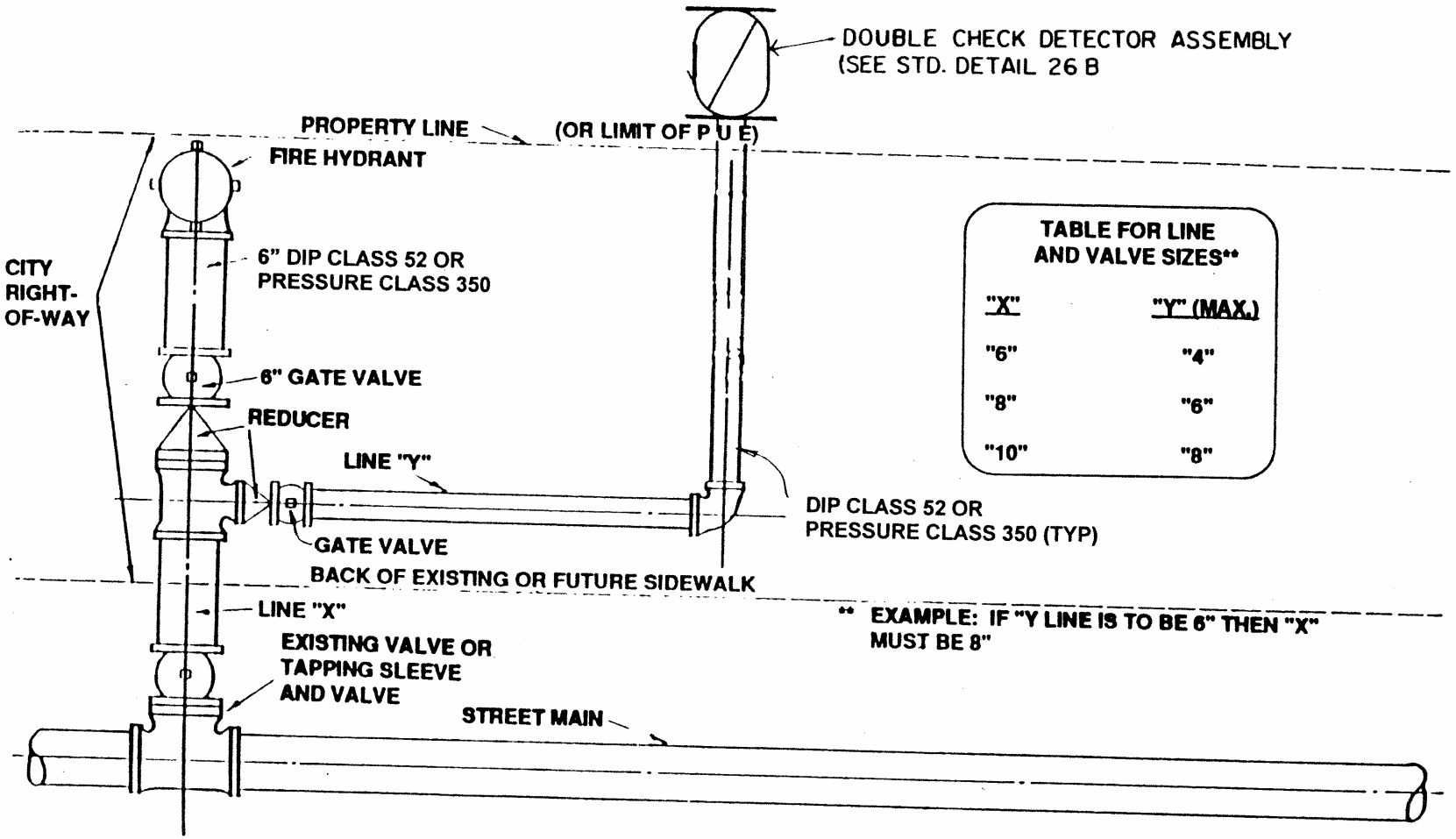


TABLE FOR LINE AND VALVE SIZES**	
"X"	"Y" (MAX.)
"6"	"4"
"8"	"6"
"10"	"8"

** EXAMPLE: IF "Y LINE IS TO BE 6" THEN "X" MUST BE 8"

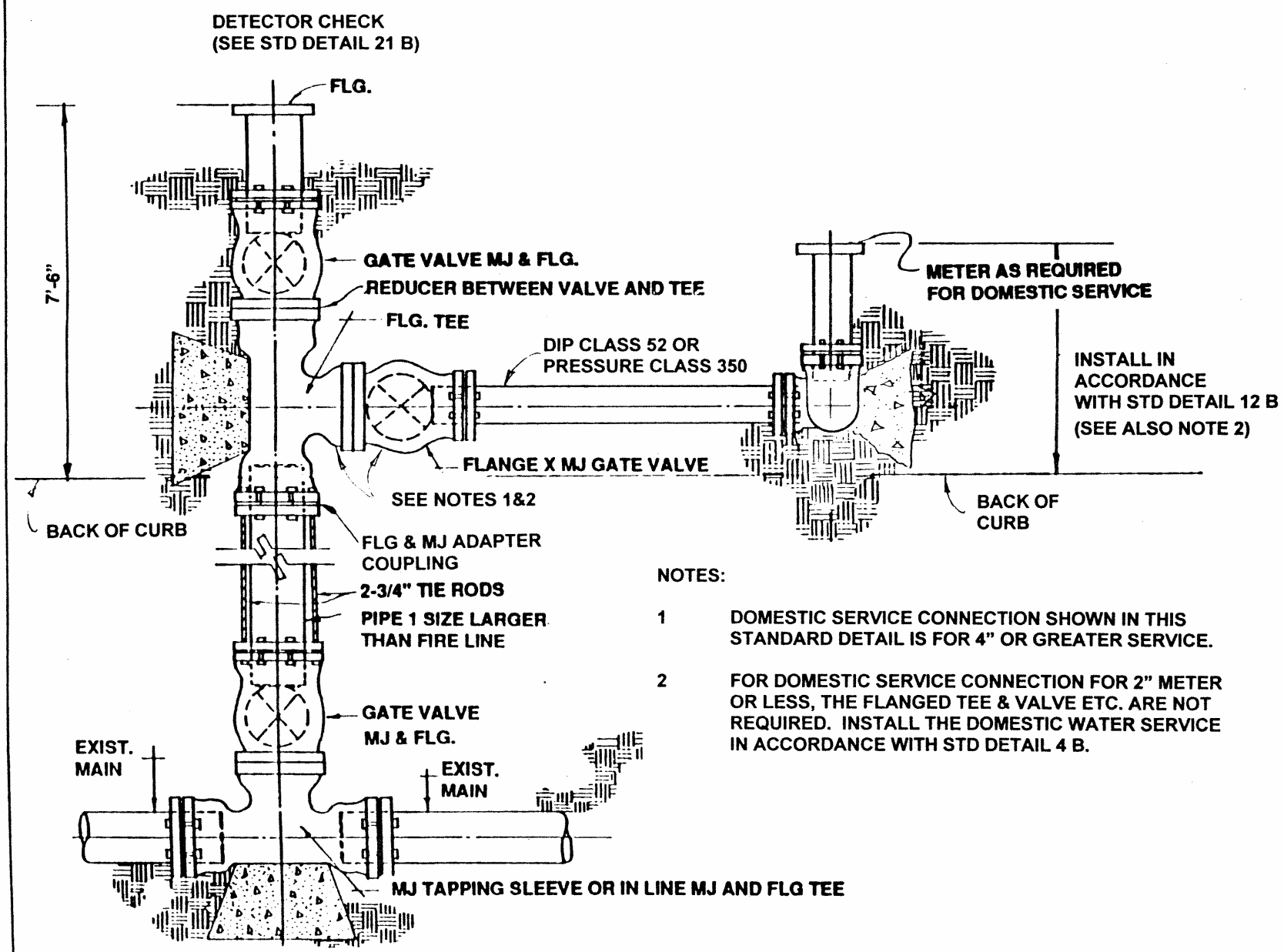
* FIRE AND DOMESTIC SERVICE – MFM/MVR METER (SIZE ACCORDING TO FIRE CODE AND USERS DEMAND. REQUIRES AT LEAST REDUCED PRESSURE BACKFLOW DEVICE).

* IRRIGATION LINE (REDUCED PRESSURE BACKFLOW DEVICE REQUIRED).

* NOTE: SERVICE CONNECTIONS OF THIS TYPE REQUIRE SPECIAL PERMISSION FROM THE DIRECTOR OF PUBLIC WORKS AND APPROVAL OF PUBLIC SAFETY.

DATE JUNE 30, 1991
REV. DATE JULY 2000
APPROVED BY:
DWG. 7B

FIRE AND DOMESTIC SERVICE
FROM A SINGLE CONNECTION



NOTES:

1 DOMESTIC SERVICE CONNECTION SHOWN IN THIS STANDARD DETAIL IS FOR 4" OR GREATER SERVICE.

2 FOR DOMESTIC SERVICE CONNECTION FOR 2" METER OR LESS, THE FLANGED TEE & VALVE ETC. ARE NOT REQUIRED. INSTALL THE DOMESTIC WATER SERVICE IN ACCORDANCE WITH STD DETAIL 4 B.

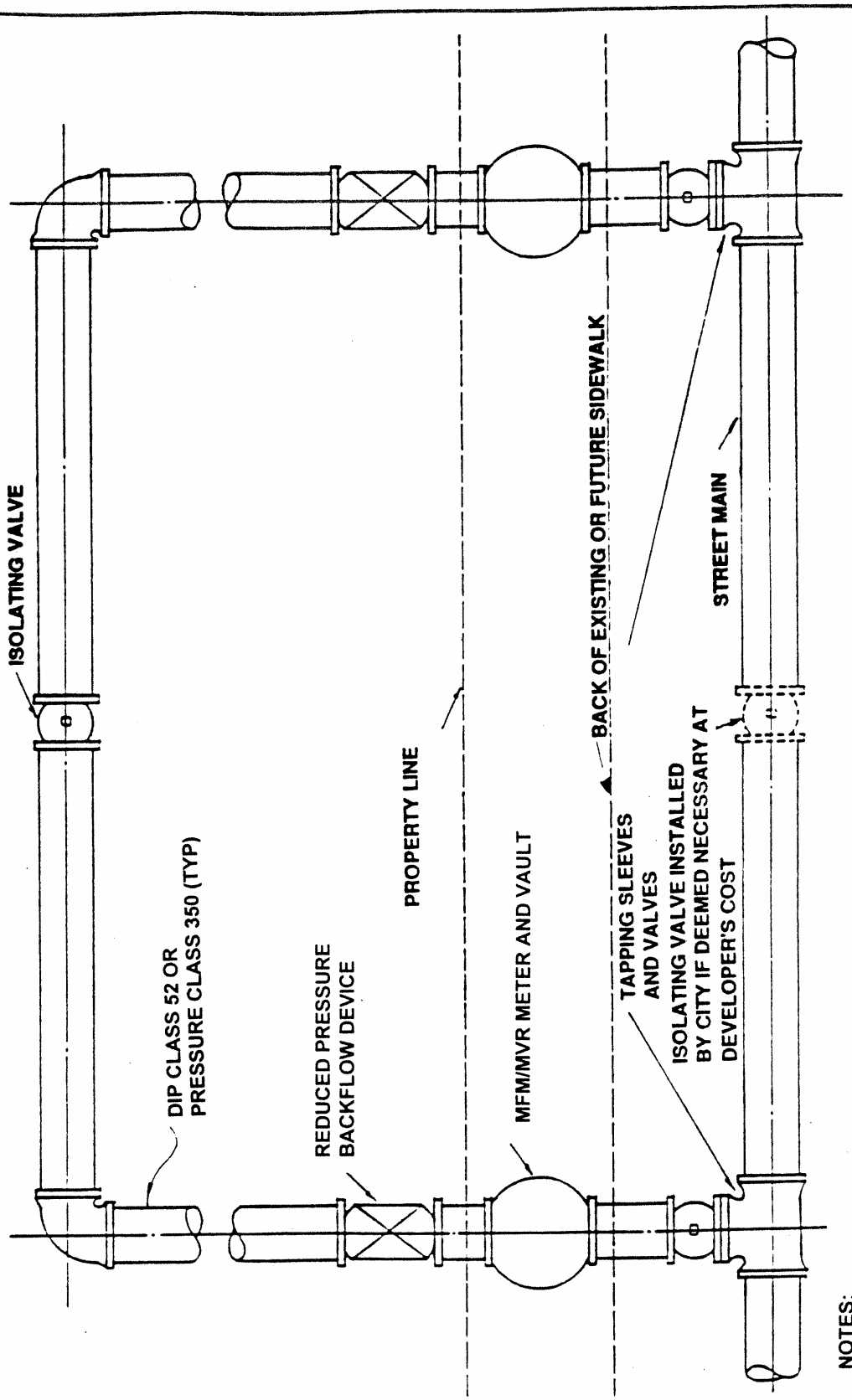
(APPROVAL OF CITY ENGINEER REQUIRED)

DATE JUNE 30, 1991
REV. DATE AUG. 1997

APPROVED BY:

DWG. 8B

2000 STANDARD DETAILS



NOTES:

1. BACKFLOW DEVICE MUST BE SAME SIZE AS PIPE IN LOOPED SYSTEM.
2. MFM/MVR METER SHALL BE SAME SIZE AS LOOPED SYSTEM OR AS OTHERWISE APPROVED BY CITY ENGINEER.

FIRE & DOMESTIC COMBINED SERVICE LOOP SYSTEM

APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: AUG. 1997

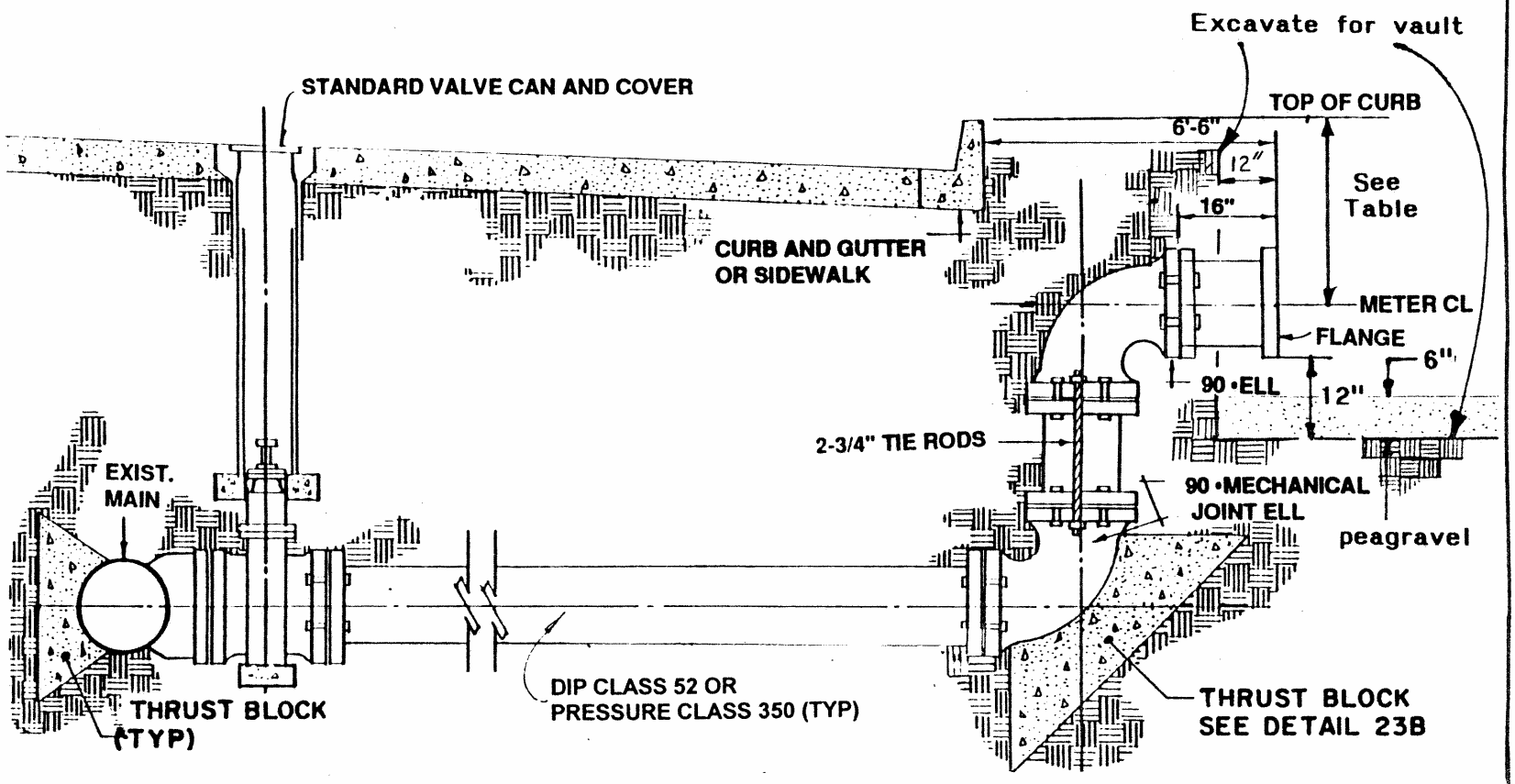
DRWG. 10B

2000 STANDARD DETAILS

REV. JULY 1998

WATER SERVICE INSTALLATION

3" THROUGH 10" METERS



NOTES:

1. VAULTS WILL BE SET IN PUBLIC RIGHT-OF-WAY.
2. WHERE MOUND LANDSCAPING IS USED, MOUND SHALL BE BEHIND THE VAULT, OR A RETAINING WALL SHALL BE CONSTRUCTED WITHIN THE MOUND AROUND THE VAULT.
3. AN EXCAVATED HOLE, COMPLETE WITH PEAGRAVEL BASE AND IN ACCORDANCE WITH THESE DETAILS, SHALL BE PROVIDED PRIOR TO CITY INSTALLATION OF VAULT, METER AND APPURTENANCES.

Service Size	Compound Meter		Turbine Meter		MFM/MVR Meter	
	TOC to Meter Centerline	Excavation Size LxW	TOC to Meter Centerline	Excavation Size LxW	TOC to Meter Centerline	Excavation Size LxW
3"	22"	5'x7'	22"	7'x5'	NA	NA
4"	22"	6'x8'	24"	8'x5'	24"	5'x5'
6"	28"	6'x8'	26"	10'x6'	24"	6'x7'
8"	NA	NA	28"	11'x7'	28"	7'x8'
10"	NA	NA	NA	NA	28"	7'x8'

NA = Not Available

CITY OF SUNNYVALE

APPROVED BY: Marvin A. Rose

DATE: JUNE 30, 1991

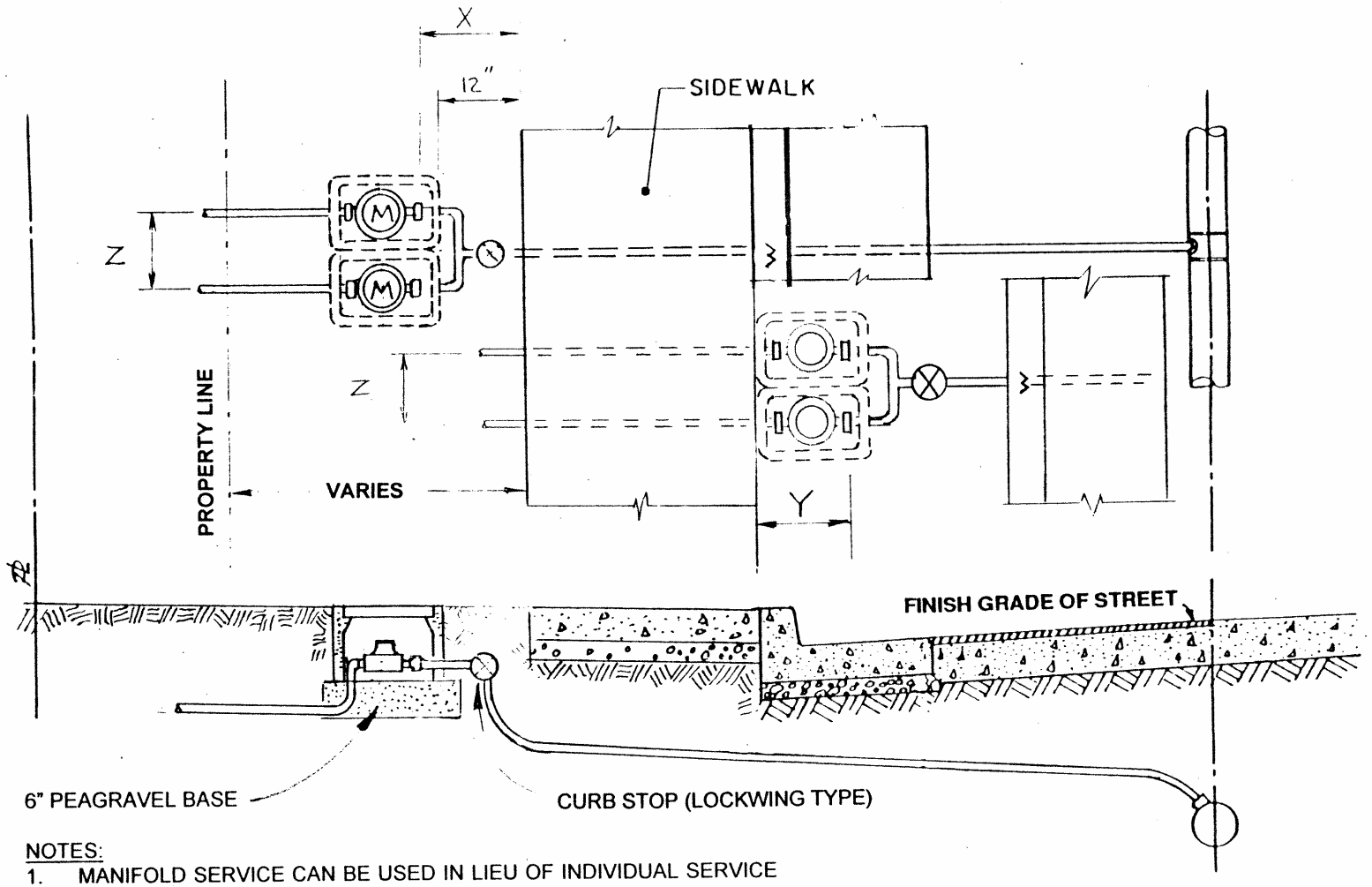
REV. DATE: August 1997

DWG. 12B

REV. JULY 1998

2000 STANDARD DETAILS

TWO METER MANIFOLD SERVICE



NOTES:

1. MANIFOLD SERVICE CAN BE USED IN LIEU OF INDIVIDUAL SERVICE LATERALS FROM THE STREET MAIN.
2. THIS DETAIL FOR DOMESTIC OR IRRIGATION METER CONNECTIONS. MAY BE COMBINED WITH FIRE SERVICE, SEE STANDARD DETAIL 8B.
3. FOR MONOLITHIC OR NO SIDEWALK LOCATIONS USE DETAIL WITH "X" DIMENSION. FOR NON-MONOLITHIC SIDEWALK, USE DETAIL WITH "Y" DIMENSION.
4. MATERIAL — MANIFOLD, NIPPLES, AND FITTINGS SHALL BE COPPER OR BRASS. COPPER PIPE CONNECTION TO BE COMPRESSION TYPE.
5. FOR FURTHER DETAILS, SEE STANDARD DETAIL 4B.

METER SIZE	5/8"	3/4"	1"	1½"	2"
X	18"	18"	19"	19"	21"
Y	14"	14"	17"	20"	26"
Z	18"	18"	18"	24"	24"
EXCAV. SIZE (WxL) (in x in)	36x24	36x24	46x30	54x30	64x36

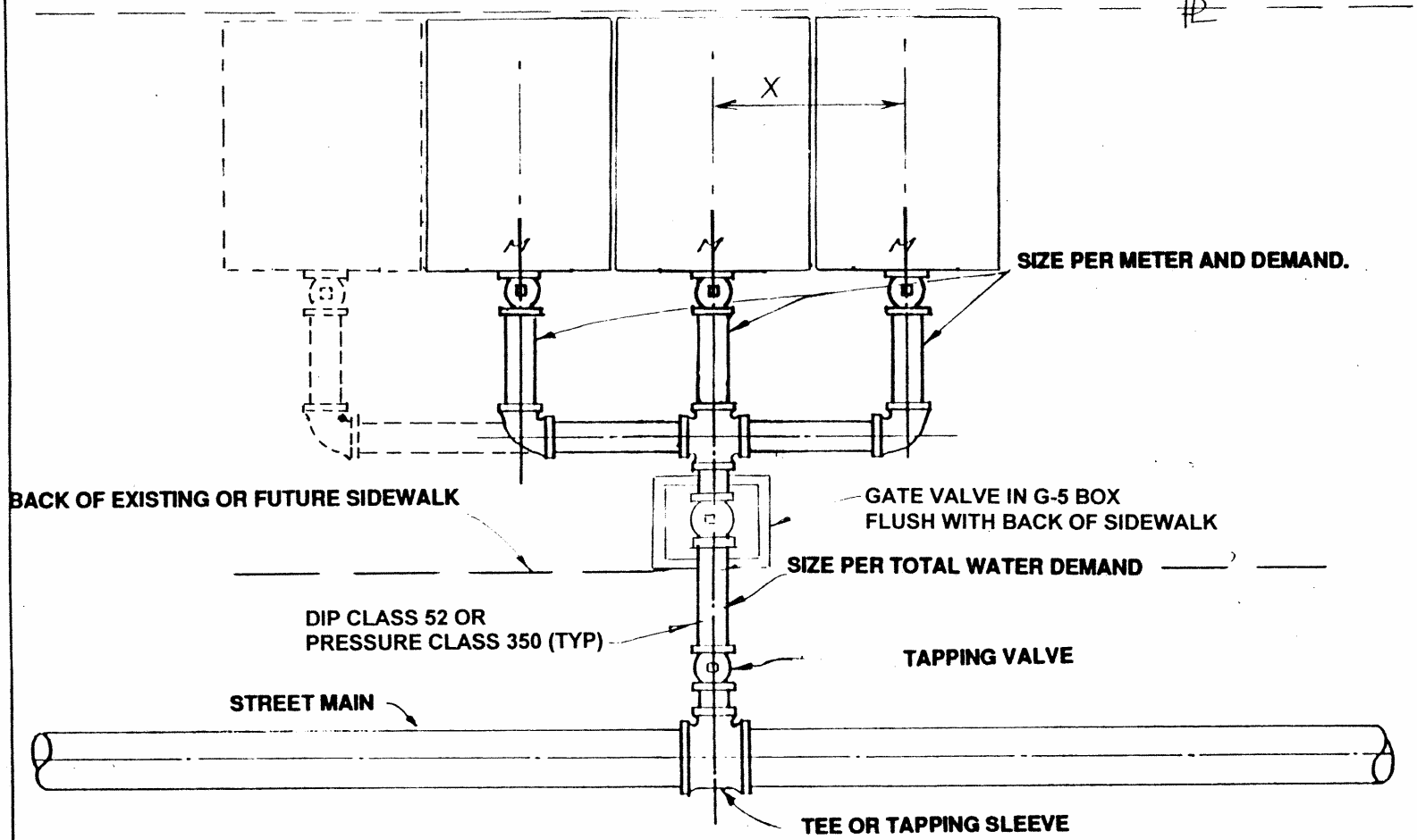
DATE: JUNE 30, 1991
REV. DATE: AUGUST, 1997
DWG. 13B

APPROVED BY:

REV. MAY 1998

2000 STANDARD DETAILS

MANIFOLD SERVICE
3 OR MORE METERS



NOTES:

1. MANIFOLD SERVICE CAN BE USED IN LIEU OF A NUMBER OF INDIVIDUAL SERVICE LATERALS FROM THE STREET MAIN.
2. THIS DETAIL FOR DOMESTIC OR IRRIGATION METER CONNECTIONS. MAY BE COMBINED WITH FIRE SERVICE, SEE STANDARD DETAIL 8B.
3. EACH METER CONNECTION MUST HAVE A CURB STOP BEFORE EACH METER.
4. MATERIAL — MANIFOLD, NIPPLES, AND FITTINGS SHALL BE COPPER OR BRASS. COPPER PIPE CONNECTION TO BE COMPRESSION TYPE.
5. FOR AN ALTERNATIVE PIPE ARRANGEMENT, SEE STD. DETAIL 14B-1.
6. FOR FURTHER DETAILS, SEE STANDARD DETAIL 4B.

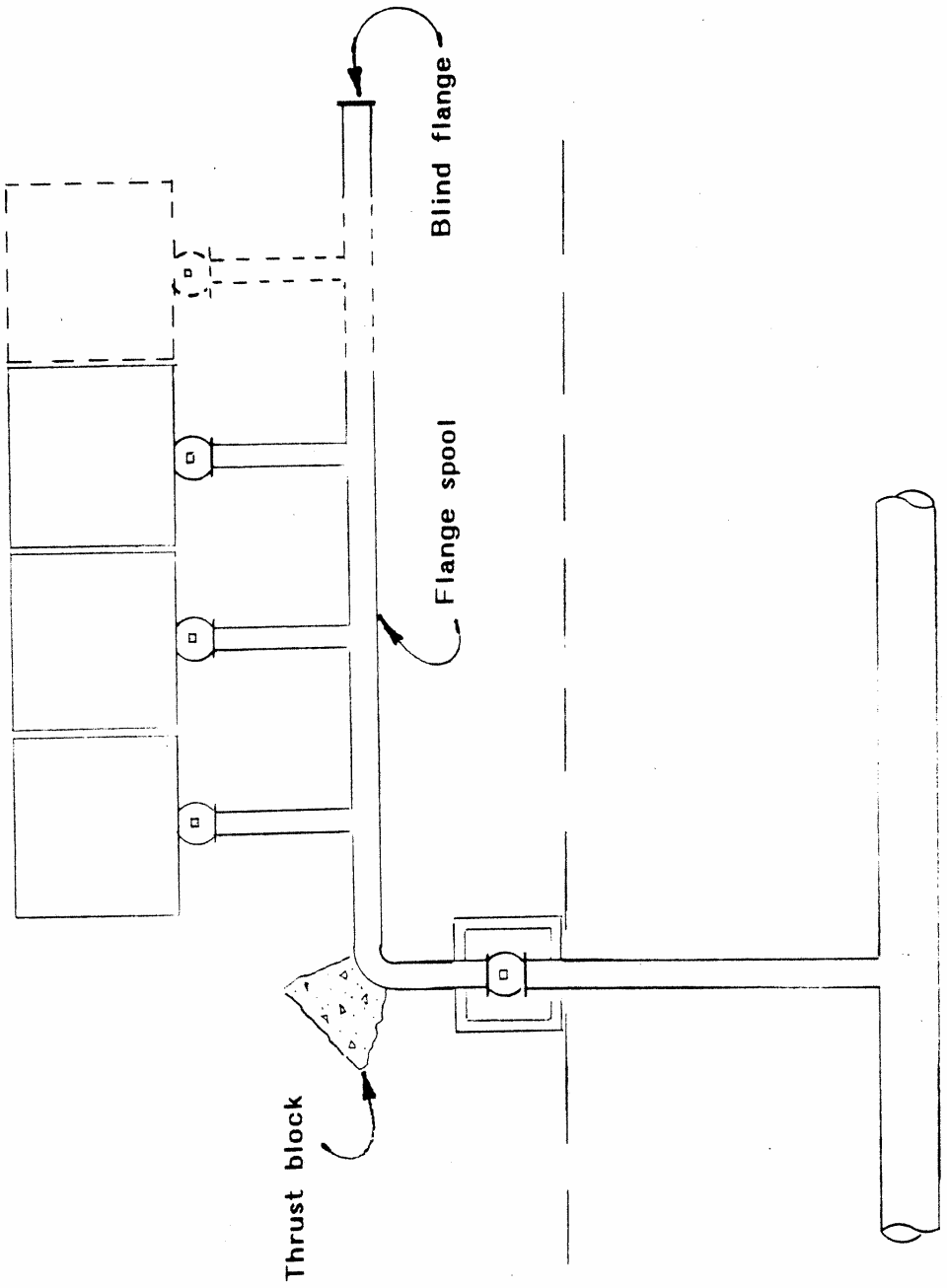
METER SIZE	5/8"	3/4"	1"	1½"	2"
X	18"	18"	18"	24"	24"
MIN. EXCAV. LENGTH FOR METER BOX (in)	24"	24"	30"	30"	36"
EXCAV. WIDTH (in)	[(SUM OF "X") + X + 6"]				

DATE: JUNE 30, 1991
REV. DATE: AUG. 1997
DETAIL 14B

APPROVED BY:

REV. JULY 1998

2000 STANDARD DETAILS



NOTE:

1. THIS IS AN ALTERNATIVE PIPE ARRANGEMENT TO THAT SHOWN ON STANDARD DETAIL 14B.
2. FOR FURTHER DETAILS, REFER TO STANDARD DETAIL 14B.

MANIFOLD SERVICE- 3 OR MORE METERS (ALTERNATIVE PIPE ARRANGEMENT)

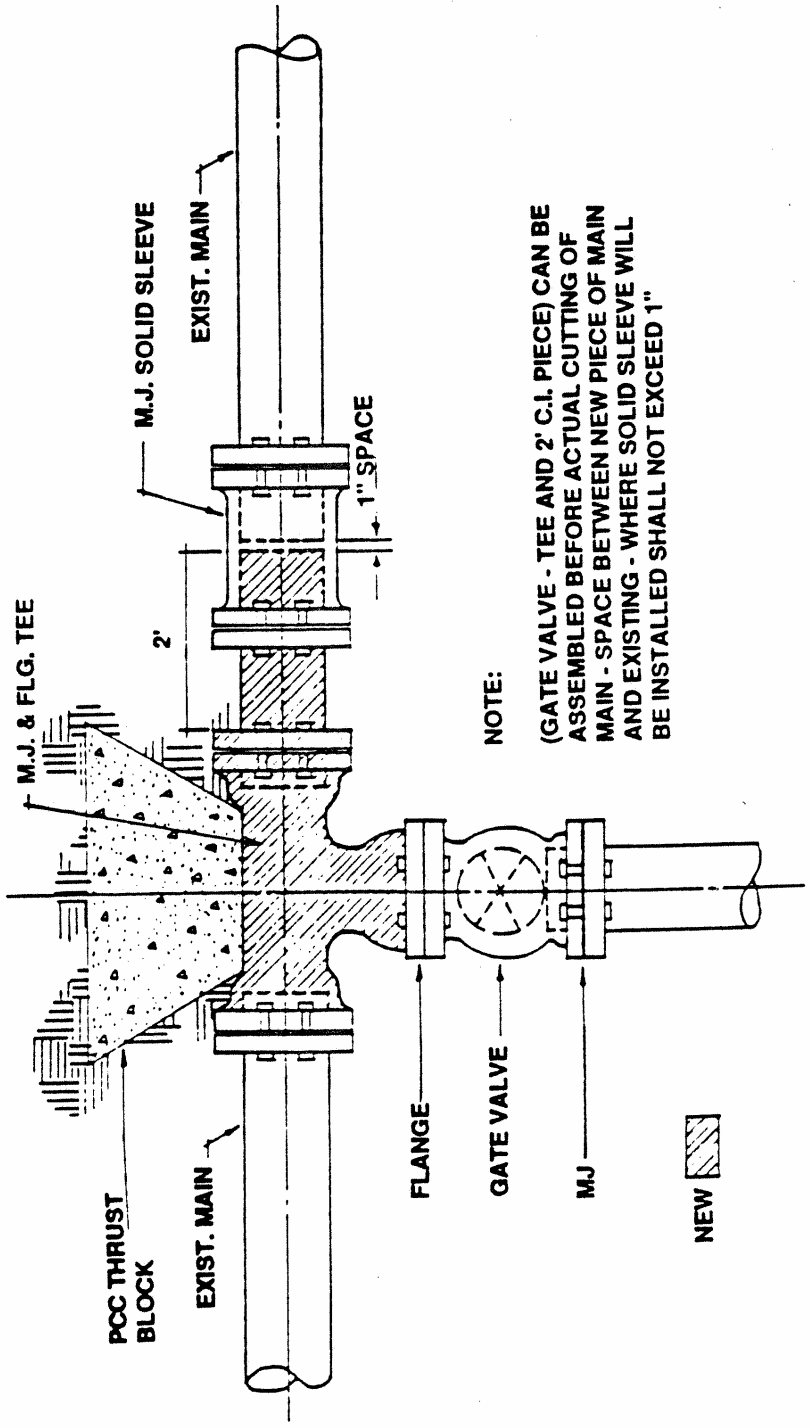
Approved By:

DATE: JULY 1998

Dwg. 14B-1

REV. JULY 1998

2000 STANDARD DETAILS



INSTALLATION OF CUT-IN TEE & GATE VALVE

APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: AUG. 1997

DRWG. 15B

2000 STANDARD DETAILS

REV. JULY 1998

WATER MAINS

THRUST BLOCK
FOR HORIZONTAL BENDS

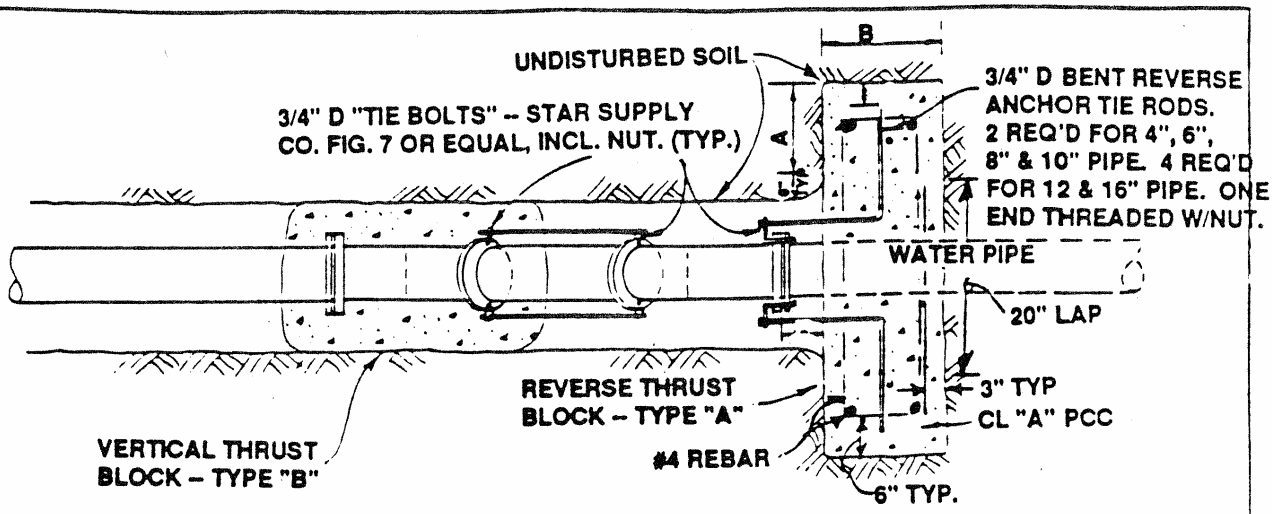
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: AUG. 1997

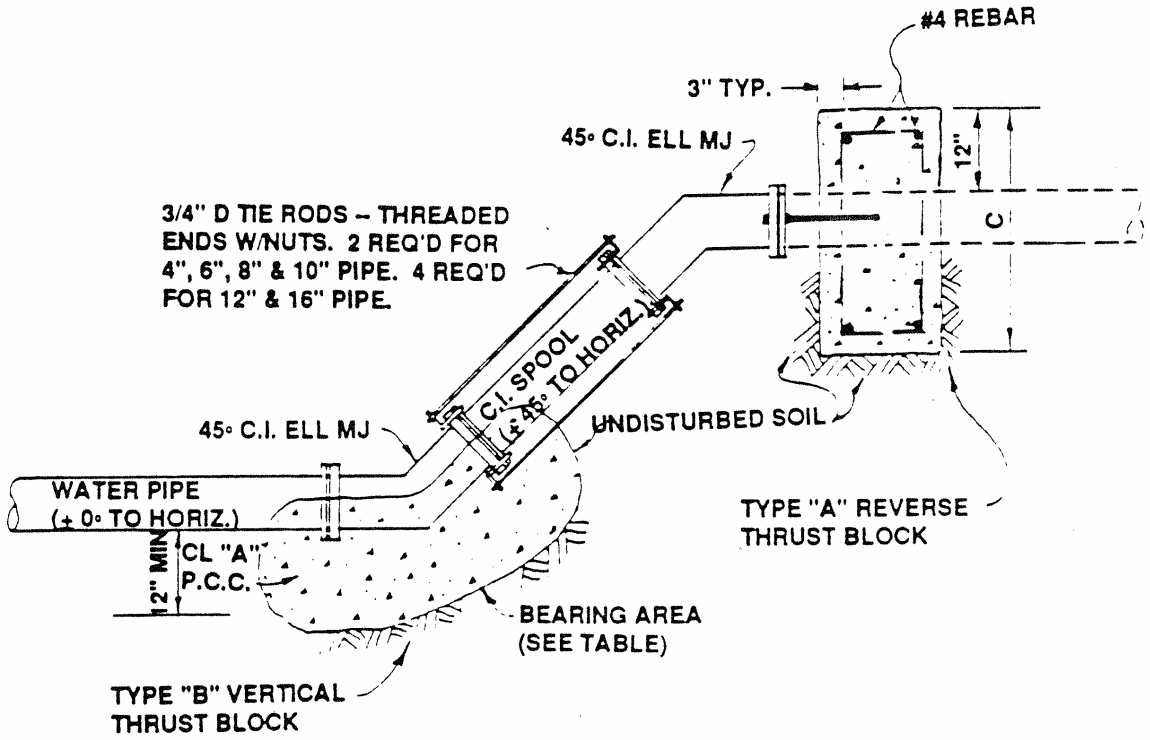
DRWG. 16B

REV. JULY 1998

2000 STANDARD DETAILS



PLAN VIEW



PIPE SIZE	A	B	C	TYPE "B" AREA	TYPE "A" VOLUME
4" & 6"	1'-0"	1'-6"	2'-8"	3 S.F.	0.75 C.Y.
8" & 10"	1'-6"	1'-6"	3'-0"	6 S.F.	1.00 C.Y.
12" & 16"	2'-0"	2'-0"	3'-10"	12 S.F.	1.90 C.Y.

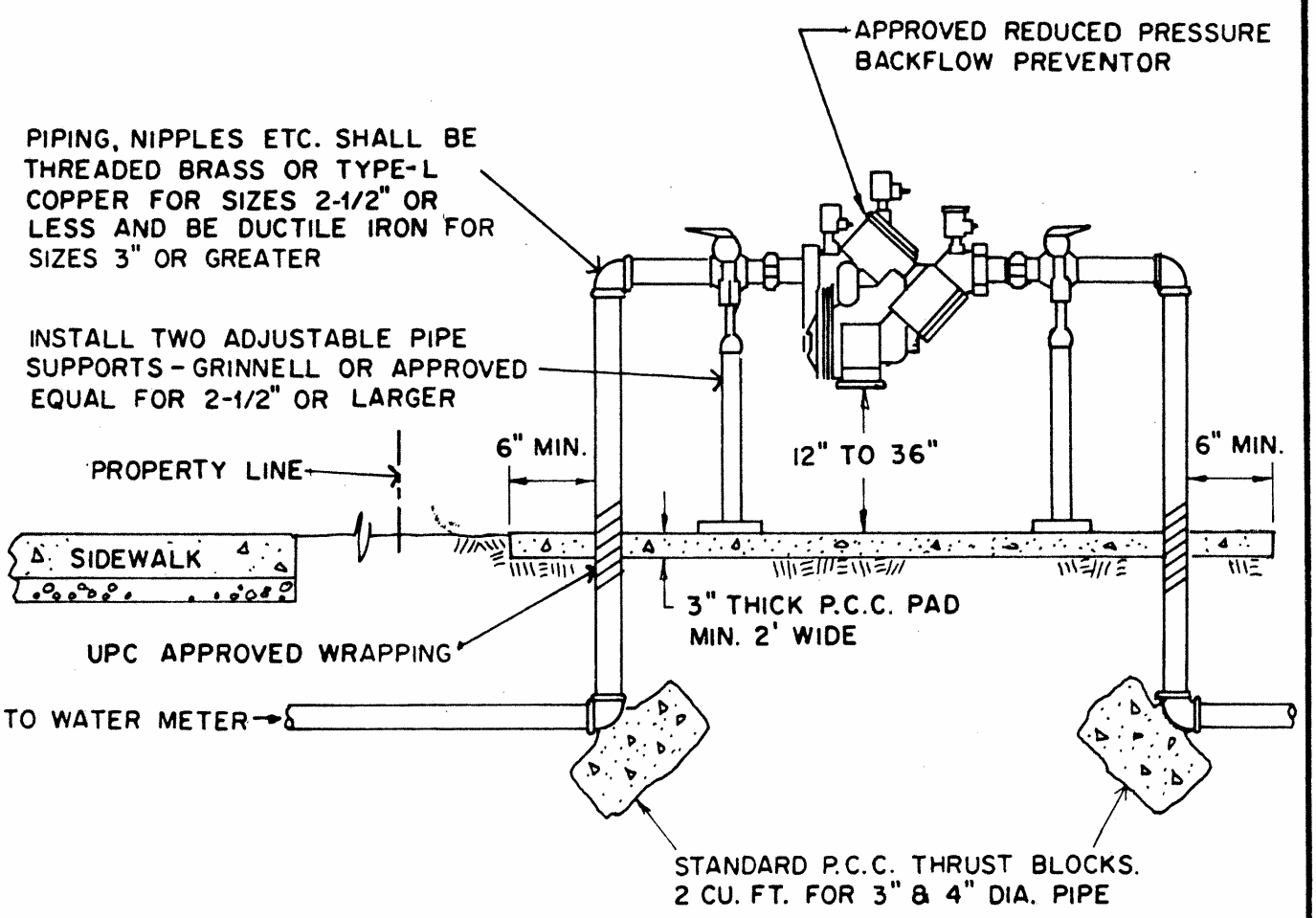
THRUST BLOCK-
REVERSE & VERTICAL BENDS

APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: AUG. 1997
DRWG. 17B

REV. JULY 1998

2000 STANDARD DETAILS



1. REDUCED PRESSURE TYPE BACKFLOW PREVENTION DEVICES SHALL BE REQUIRED FOR ANY USE WHERE TOXIC MATERIALS ARE USED OR WHERE POSITIVE PROTECTION FOR THE PUBLIC WATER SUPPLY IS REQUIRED.
2. REDUCED PRESSURE TYPE BACKFLOW ASSEMBLY MUST BE ON LIST OF APPROVED DEVICES BY THE CALIFORNIA DEPT. OF HEALTH SERVICES.
3. BACKFLOW DEVICES SHALL BE INSTALLED ADJACENT TO AND ON PROPERTY SIDE OF SIDEWALK WHERE APPLICABLE. THE ASSEMBLY SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE WATER METER.
4. ALL DEVICES 3/4" TO 2" WILL HAVE RESILIENT SEATED SHUT-OFF VALVES AND TEST COCKS WITH THREADED ENDS, 3" AND LARGER DEVICES WILL HAVE RESILIENT SEATED GATE VALVES, WITH FLANGED ENDS.
5. PRESSURE DIFFERENTIAL VALVE OPENING TO BE 12" ABOVE GRADE TO A MAX. OF 36".
6. PIPING, NIPPLES ETC. SHALL BE THREADED BRASS OR TYPE-L COPPER FOR SIZES 2-1/2" OR OR LESS, AND BE FLANGED DUCTILE IRON FOR 3" OR LARGER. (NO GALVANIZED STEEL PIPING).
7. INSTALL TWO ADJUSTABLE PIPE SUPPORTS, (GRINNELL OR APPROVED EQUAL) FOR 2-1/2" OR LARGER.

BACKFLOW PREVENTION DEVICE

1 OF 2

CITY OF SUNNYVALE CALIFORNIA

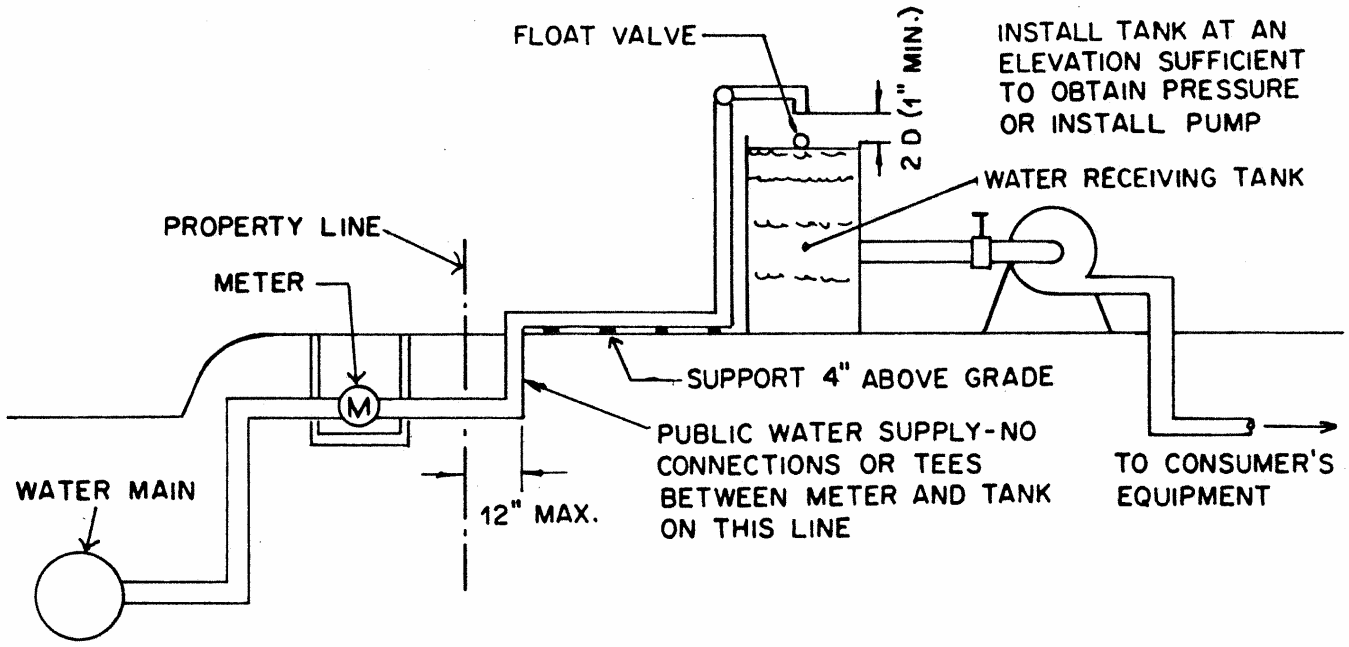
APPROVED

DATE JULY 15, 2000

REV. DATE

DRWG. 18B

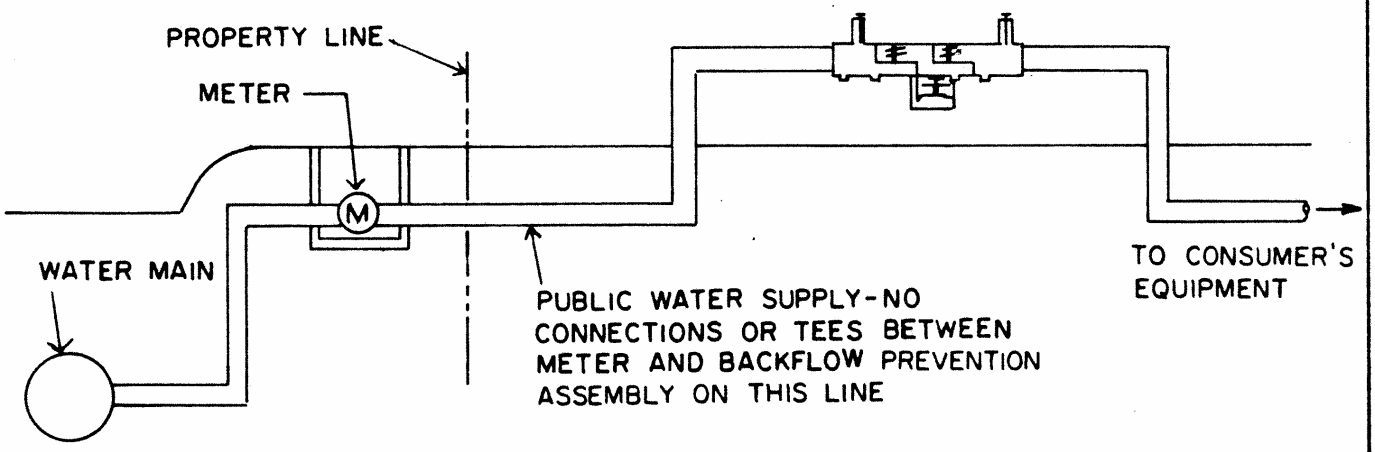
2000 STANDARD DETAILS



NOTE:

TANK SHOULD BE OF SUBSTANTIAL CONSTRUCTION AND OF A KIND AND SIZE TO SUIT CONSUMER'S NEEDS. TANK MAY BE SITUATED AT GROUND LEVEL (WITH A PUMP TO PROVIDE ADEQUATE PRESSURE HEAD) OR BE ELEVATED ABOVE GROUND.

AIR GAP SEPARATION



NOTE:

PLACE ASSEMBLY 12" OR MORE ABOVE HIGH WATER LEVEL OF SURROUNDING GROUND.

RESILIENT SEATED SHUT-OFF VALVES AND TESTCOCKS ARE REQUIRED.

BACKFLOW PREVENTION ASSEMBLY

INSTALLATION OF BACKFLOW PREVENTION DEVICES 2 OF 2

CITY OF SUNNYVALE CALIFORNIA

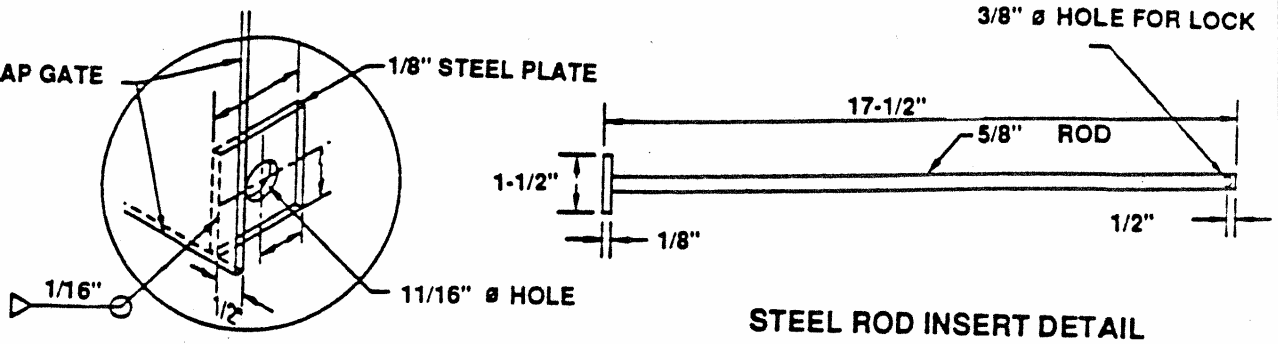
APPROVED

DATE JULY 15, 2000

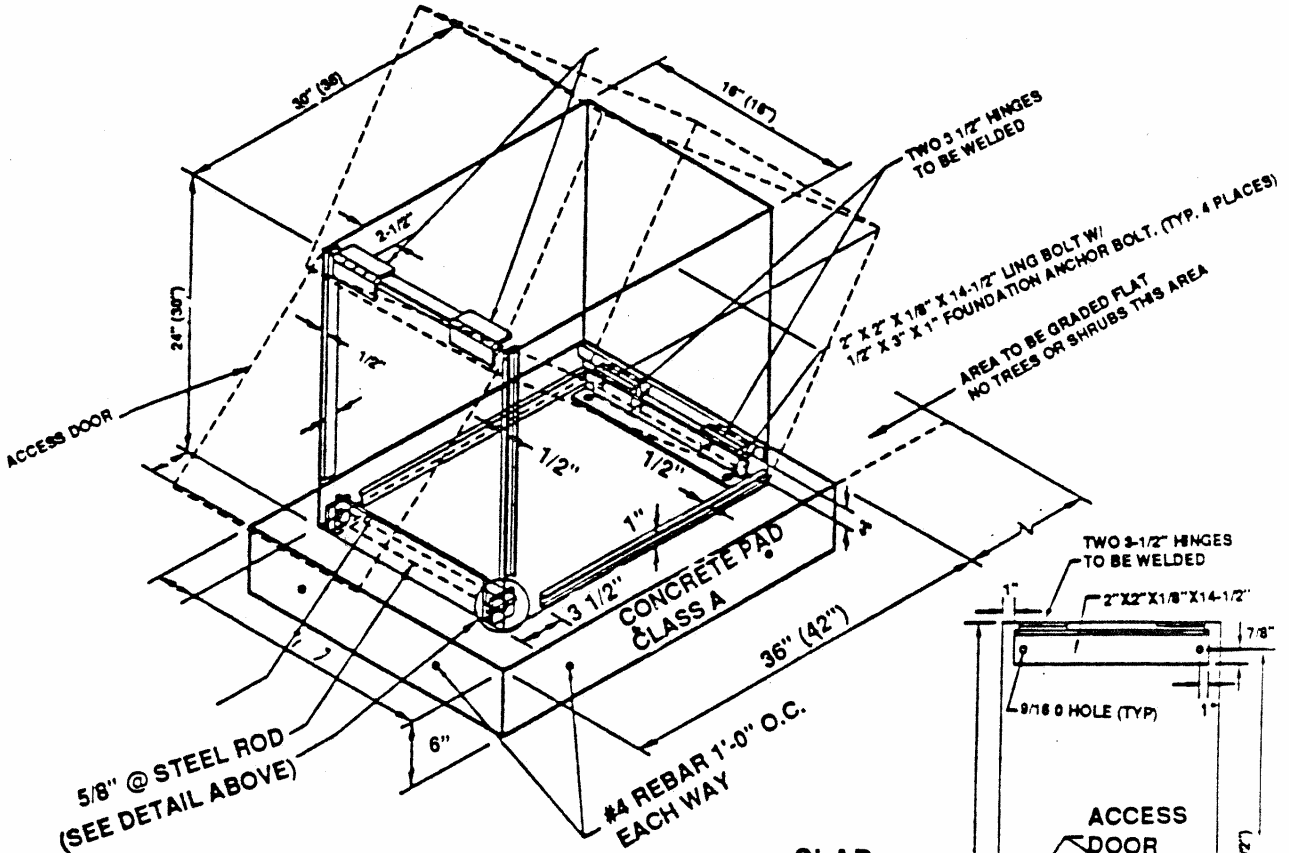
REV. DATE

DRWG. 19B

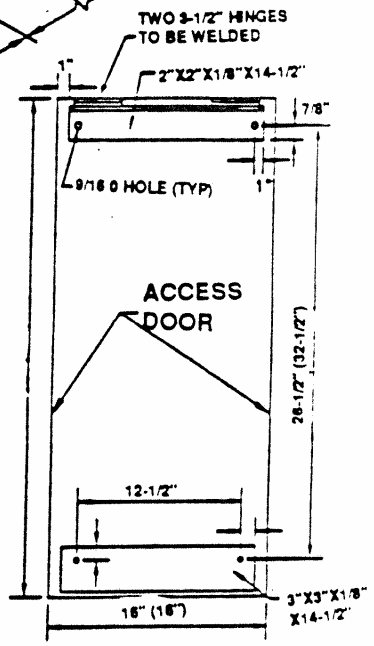
2000 STANDARD DETAILS



STEEL ROD INSERT DETAIL



SLAB CONNECTION LAYOUT



NO SCALE

NOTES: (IF REQUIRED)

1. VANDAL PROOF BACKFLOW PREVENTOR ENCLOSURE TO BE 12 GA. COLD ROLLED STEEL. CABINET TO HAVE A LOCKING MECHANISM KEYED TO KEYS FURNISHED BY OWNER.
2. NUMBERS IN PARENTHESES DENOTE DIMENSIONS FOR A 2" OR 1-1/2" BACKFLOW PREVENTION DEVICE.
3. NUMBERS NOT IN PARENTHESES DENOTE DIMENSIONS FOR A 1" OR 3/4" BACKFLOW PREVENTION DEVICE.

BACKFLOW PREVENTION DEVICE ENCLOSURE

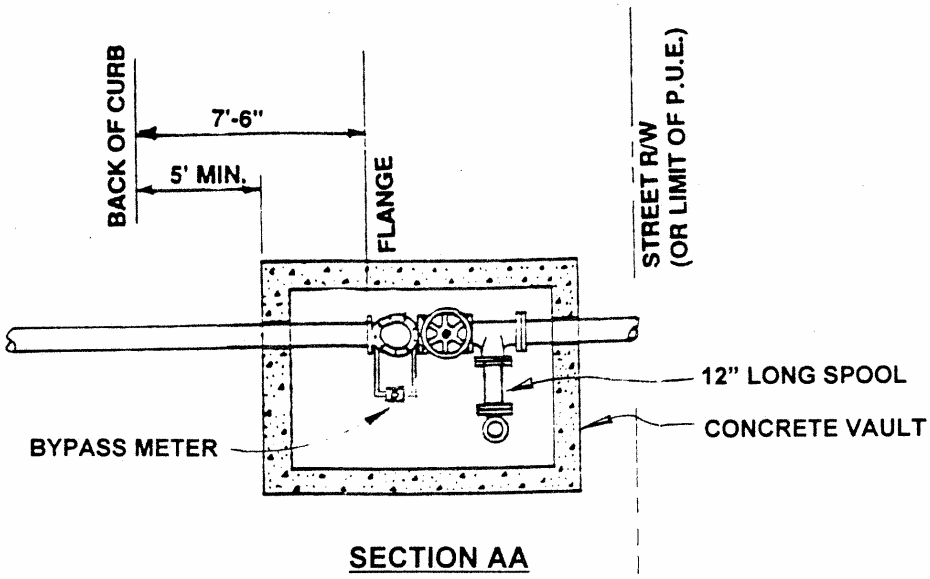
APPROVED BY:

DATE JUNE 30, 1991

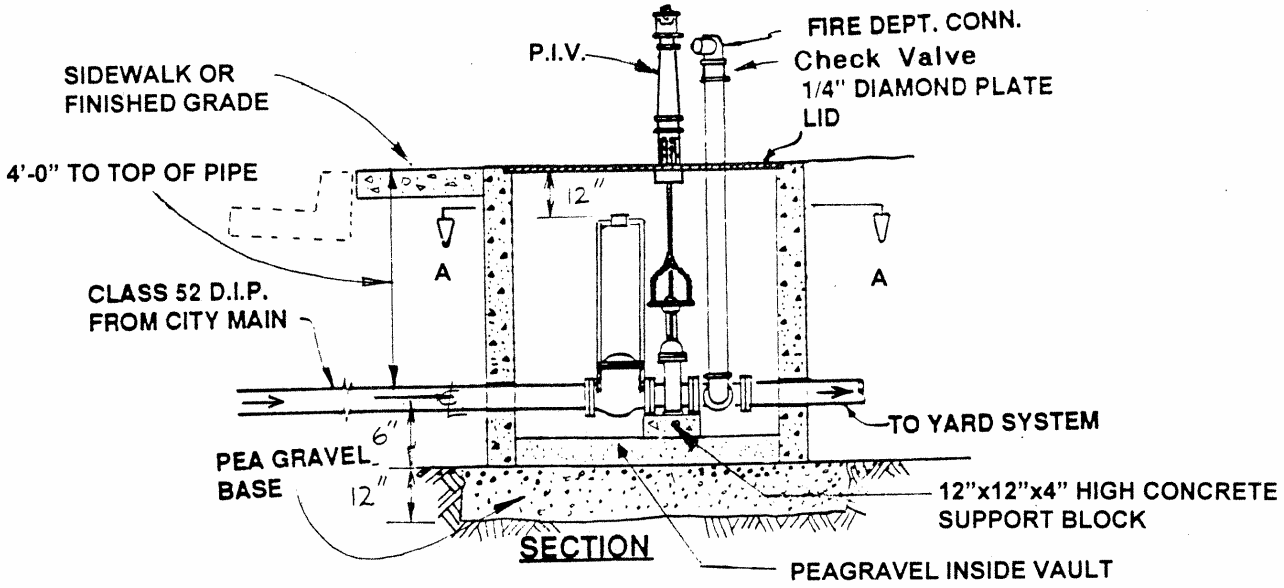
REV. DATE

20 B

2000 STANDAR DETAILS



SECTION AA



NOTES:

1. A 7' LONG AND 6' WIDE EXCAVATION SHALL BE PROVIDED FOR INSTALLATION OF VAULT.
2. CITY FURNISHES AND INSTALLS:
   a) CONCRETE VAULT.
   b) PEAGRAVEL INSIDE VAULT ABOVE THE VAULT BASE.
   c) DETECTOR CHECK.
   d) BYPASS METER + ASSOCIATED PIPEWORK + FITTINGS.
   e) VAULT LID.

DETECTOR CHECK- FIRE SERVICE

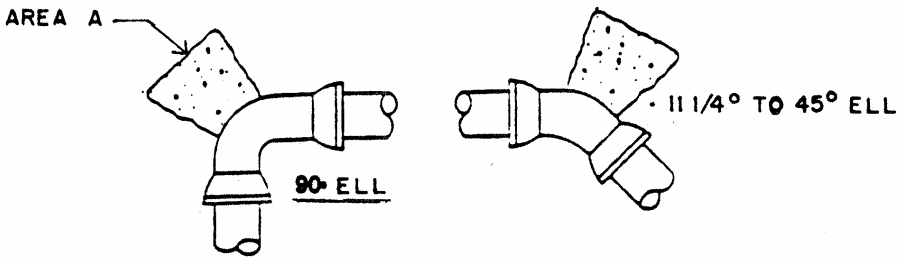
CITY OF SUNNYVALE, CALIFORNIA

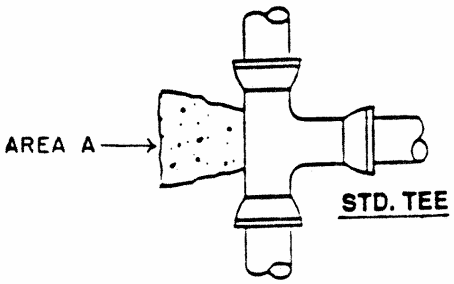
Marvin A Rose
APPROVED BY:

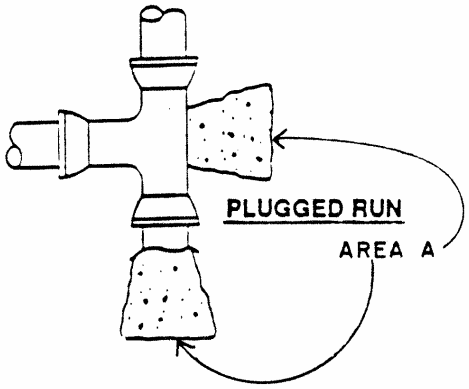
DATE: JUNE 30, 1991
REV. DATE: JULY 2000

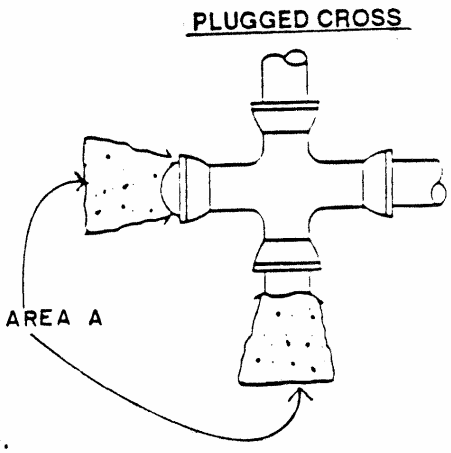
DRWG. 21B

2000 STANDARD DETAILS









NOTE:

1. ALL THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH.

AREA (A) IN SQ. FT.

TYPE OF FITTING	SIZE OF PIPE							
	4"	6"	8"	10"	12"	14"	16"	18"
90° ELL	1.5	3	5	8	11	15	19	24
45° ELL	1	2	3	4	6	8	11	13
22 1/2° ELL	1	2	2	2	3	4	6	7
11 1/4° ELL	1	2	2	2	2	2	3	4
PLUG/TEE	1	2	4	6	8	11	14	17

BASED ON SOIL BEARING VALUE OF 3,000 LBS. PER SQ. FT. AND WATER PRESSURE OF 200 PSI FORM AS REQUIRED TO KEEP HYDRAULIC FORCES OFF OF MECHANICAL JOINT OR FLANGE BOLTS.

NO SCALE

THRUST BLOCKS MISCELLANEOUS

APPROVED BY:

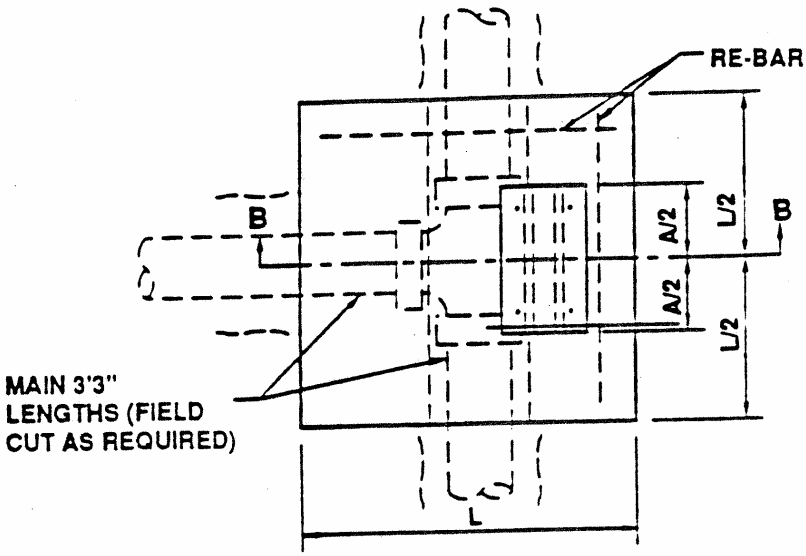
DATE: JUNE 30, 1991

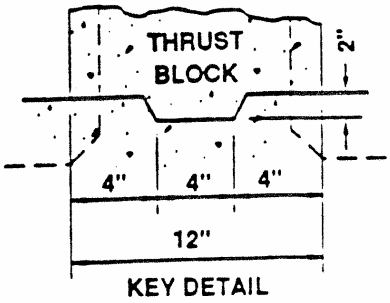
REV. DATE: AUGUST, 1997

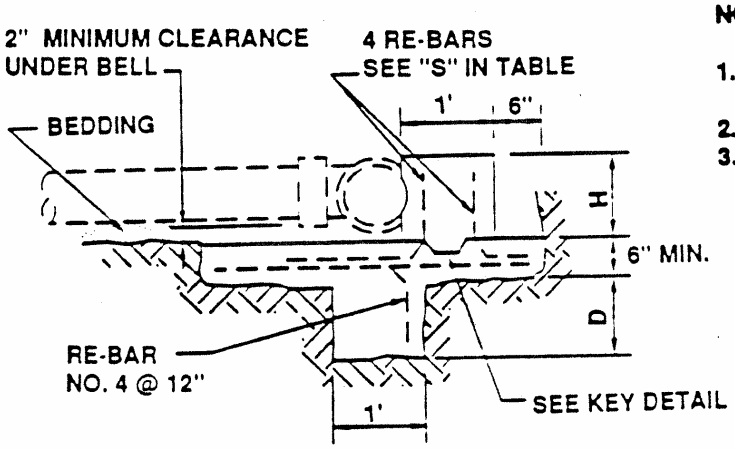
DRAWING 23B

REV. JULY 1998

2000 STANDARD DETAILS







SECTION B-B

NOTES:

1. ALL FITTING JOINTS WILL BE CLEAR OF ALL CONCRETE.
2. CONCRETE SHALL BE TYPE V.
3. USE 3' LENGTHS OF PIPE ONE EACH SIDE EVERY FITTING.

DIMENSION TABLE FOR TEE AND DEAD ENDS						
PIPE DIAMETER	TEE A	DEAD END A	D	H	L	RE-BAR "S" SIZE
6"	16"	8"	12"	12"	4'	NO. 4
8"	18"	10"	12"	14"	4'	NO. 4
10"	22"	12"	24"	16"	4'	NO. 5
12"	24"	14"	36"	18"	5'	NO. 6

NO SCALE

THRUST BLOCKS IN BAY MUD-

1 OF 2

APPROVED BY:

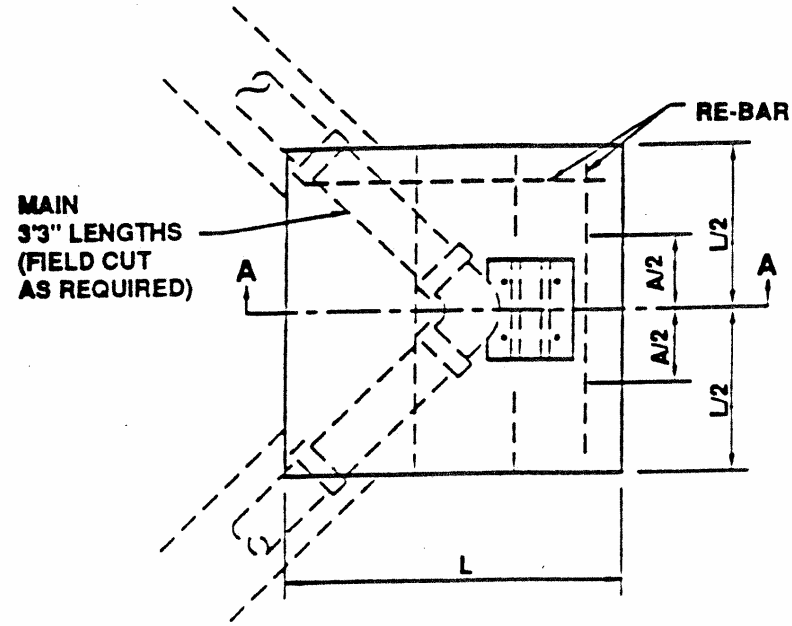
DATE: JUNE 30, 1991

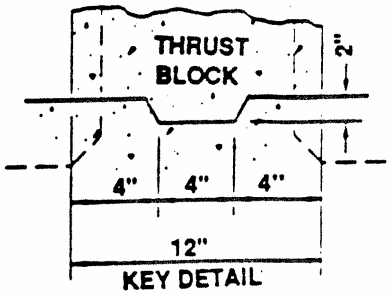
REV. DATE: AUG. 1997

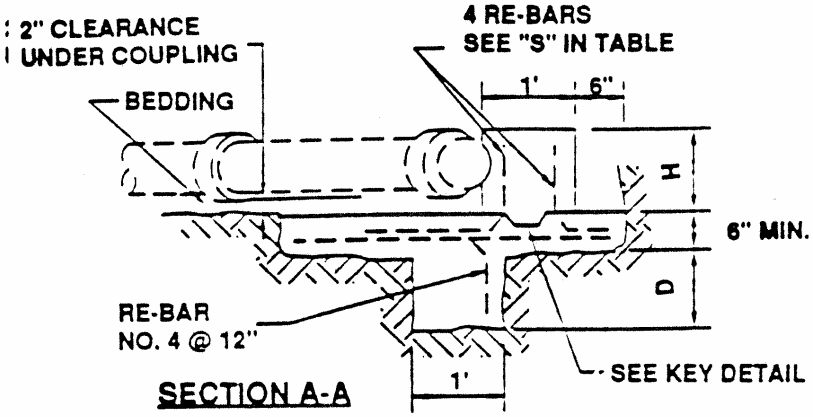
DRWG. NO. 24B

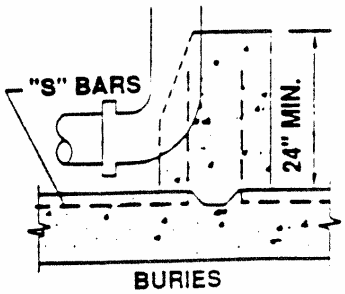
REV. JULY 1998

2000 STANDARD DETAILS









NOTES:

1. ALL FITTING JOINTS WILL BE CLEAR OF ALL CONCRETE.
2. CONCRETE SHALL BE TYPE V.
3. USE 3' LENGTHS OF PIPE ONE EACH SIDE EVERY FITTING.

DIMENSION TABLE FOR HORIZONTAL BENDS																				
PIPE DIAMETER	90 DEG BEND					45 DEG BEND					22 DEG 30' BEND					11 DEG 15' BEND				
	A	D	H	L	RE-BAR "S" SIZE	A	D	H	L	RE-BAR "S" SIZE	A	D	H	L	RE-BAR "S" SIZE	A	D	H	L	RE-BAR "S" SIZE
6"	15"	12"	12"	4'	NO. 4	10"	12"	12"	3'	NO. 4	8"	6"	12"	3'	NO. 4	7"	6"	12"	3'	NO. 4
8"	18"	12"	14"	4'	NO. 4	12"	12"	14"	4'	NO. 4	9"	6"	14"	3'	NO. 4	8"	6"	14"	3'	NO. 4
10"	23"	24"	16"	5'	NO. 5	13"	12"	16"	4'	NO. 5	11"	12"	16"	4'	NO. 4	9"	6"	16"	3'	NO. 5
12"	26"	36"	18"	5'	NO. 6	15"	24"	18"	4'	NO. 5	13"	12"	18"	4'	NO. 4	10"	6"	18"	4'	NO. 5

NO SCALE

THRUST BLOCKS IN BAY MUD- 2 OF 2

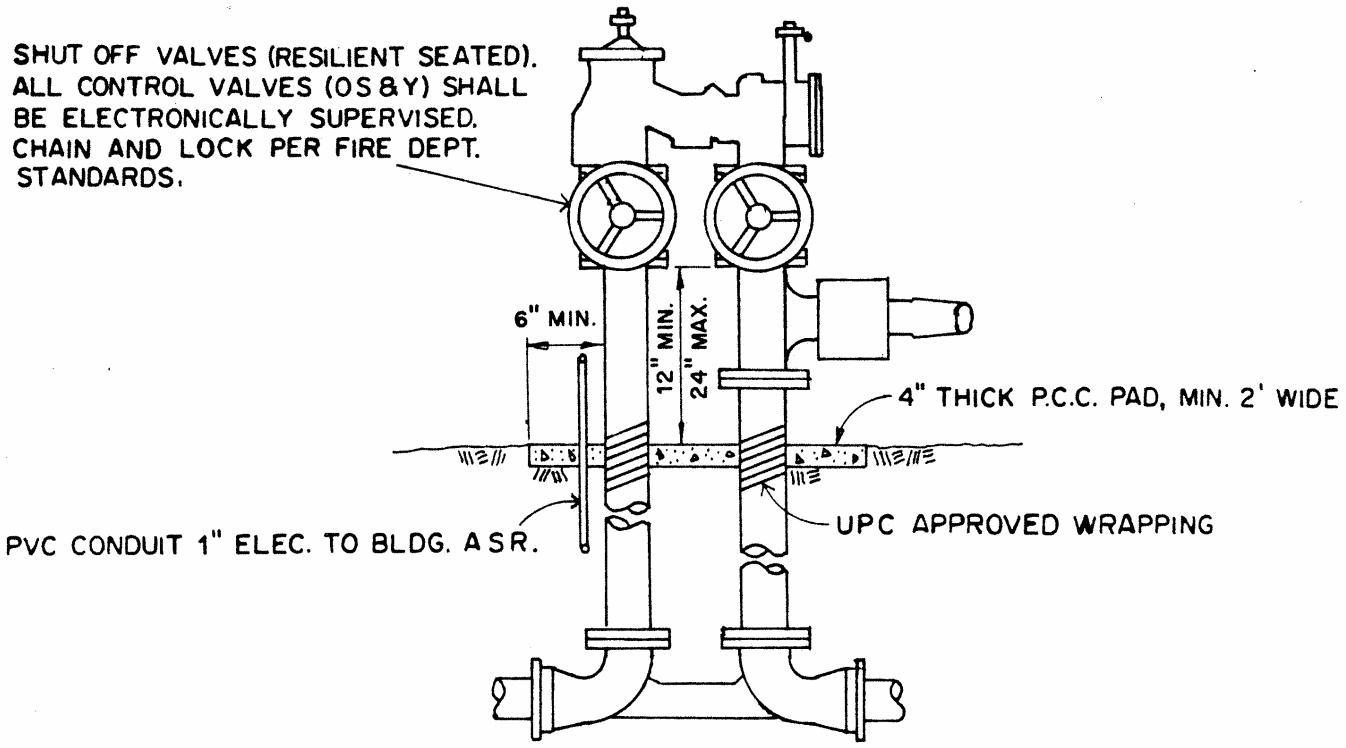
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: AUG. 1997

DRAWING 25B

2000 STANDARD DETAILS

REV. JULY 1998



NOTES:
1. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE ON THE APPROVED LIST OF THE STATE OF CALIF. HEALTH SERVICES DEPT.
2. DOUBLE CHECK DETECTOR CHECK ASSEMBLY SHALL BE FEBCO MODEL 876V OR PRIOR APPROVED EQUAL.
3. MAXIMUM DISTANCE BETWEEN FIRE DEPT. CONNECTION AND PUBLIC FIRE HYDRANT SHALL BE 50', UNLESS SPECIFICALLY APPROVED BY FIRE DEPT.
4. FDC TO REMAIN VISIBLE AND ACCESSIBLE.
5. DIP TO BE PROTECTED WRAP CA-1200, POLYGUARD CA-14 MASTIC, OR APPROVED EQUAL.
6. ALL CONNECTIONS TO BE FLANGED.
7. ALL TRIM HARDWARE TO BE BRASS OR BRONZE.
8. METER TO REGISTER IN CUBIC FEET.
9. BY-PASS METER PIPING TO BE INSULATED AGAINST FREEZING.
10. MASTIC ALL BOLTS/NUTS OR USE STAINLESS STEEL COMPONENTS.

DOUBLE CHECK DETECTOR ASSEMBLY

CITY OF SUNNYVALE CALIFORNIA

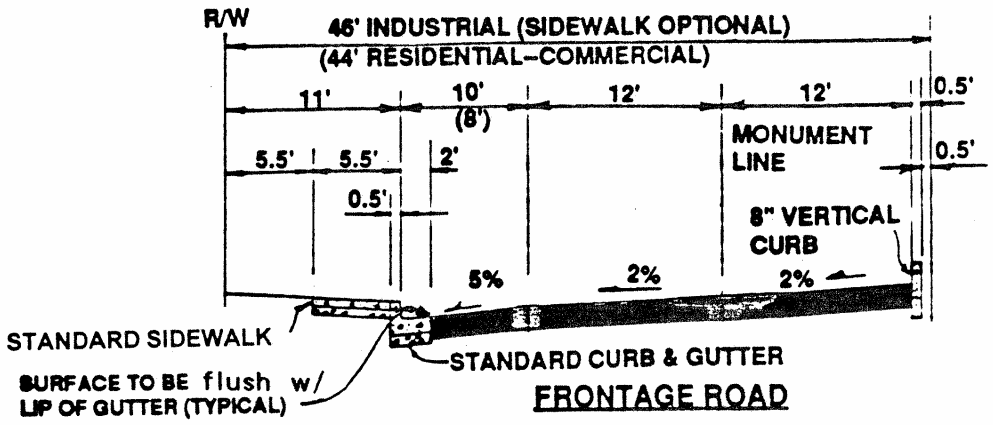
APPROVED

DATE JUNE 28, 2000

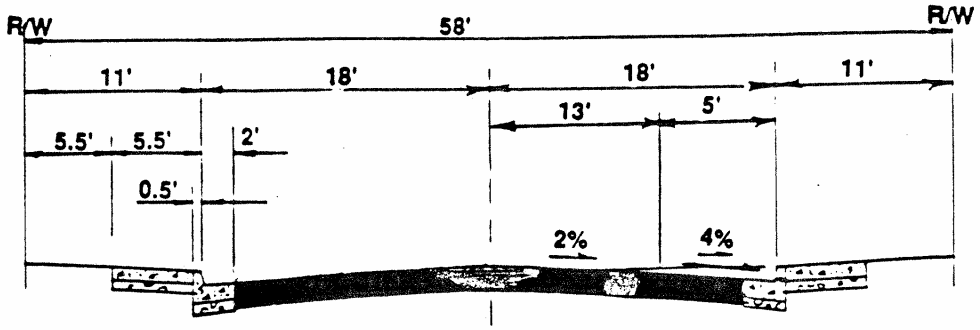
REV. DATE

DRWG. 26 B

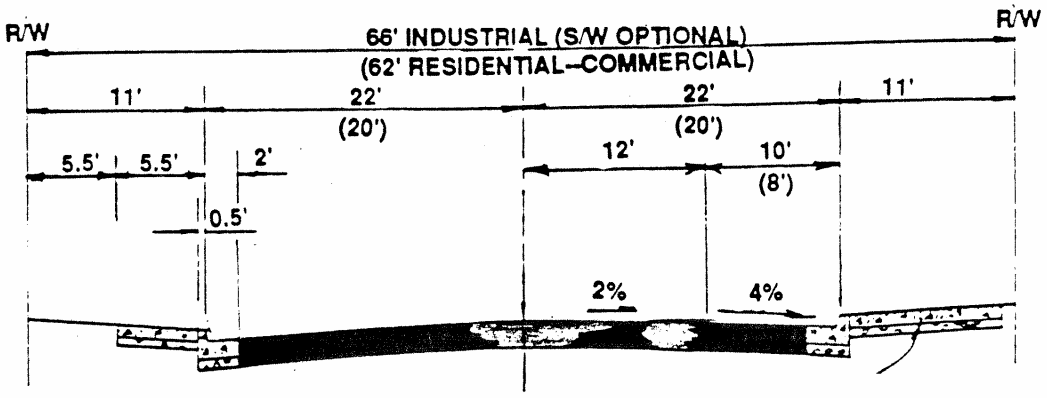
2000 STANDARD DETAILS



FRONTAGE ROAD



MINOR STREET – SINGLE FAMILY RESIDENTIAL



TWO LANE STREET

NOTE:

PAVEMENT SECTIONS TO BE MIN. 6" DEEPLIFT ASPHALTIC CONCRETE, UNLESS OTHERWISE SPECIFIED.

NO SCALE

2 LANE STREET SECTIONS

APPROVED BY:

DATE: JUNE 30, 1991

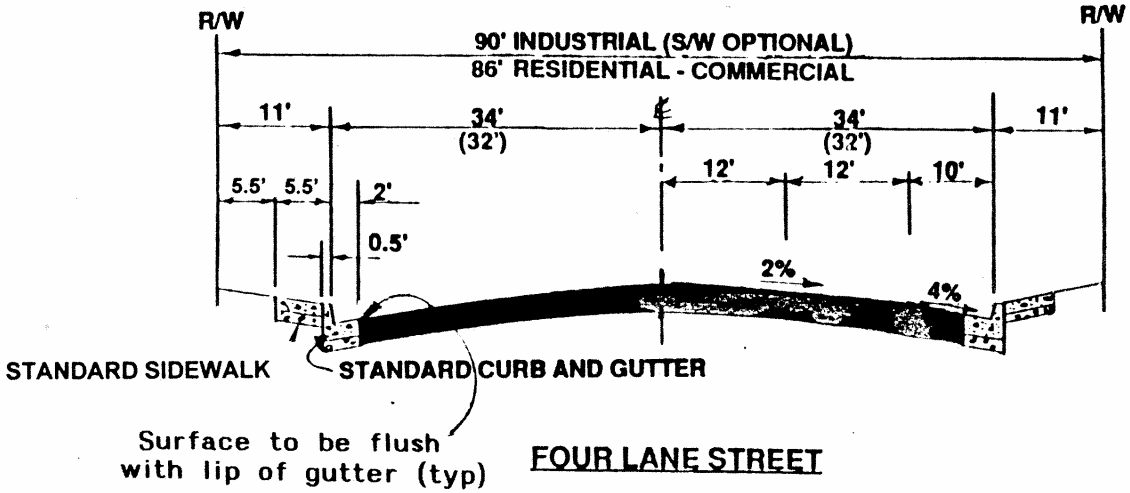
REV. DATE:

DWG. 1C

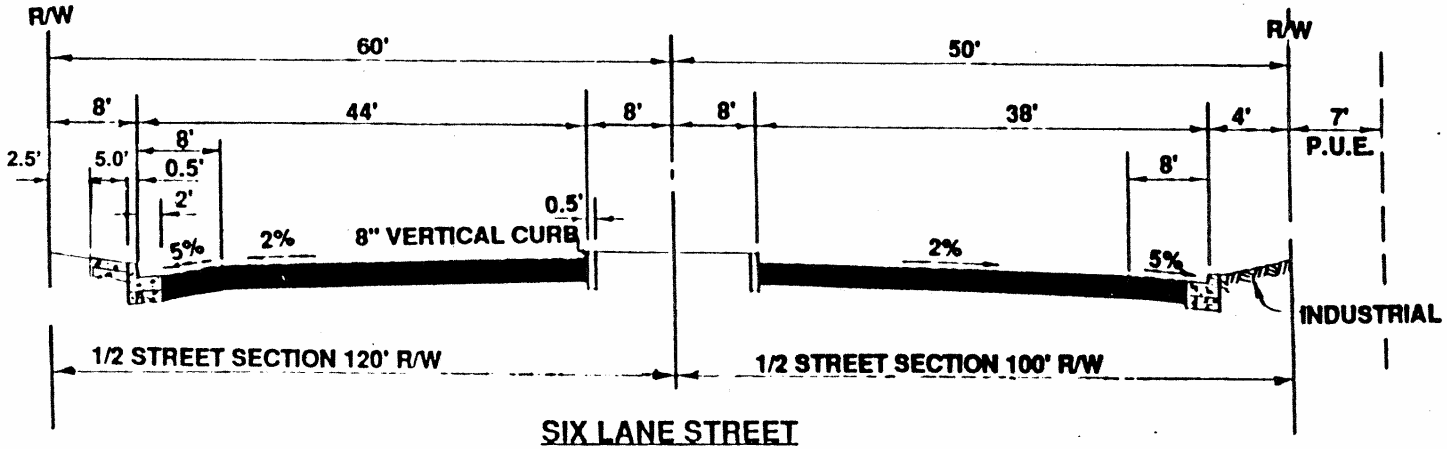
2000 STANDARD DETAILS

REV. JULY 1998

4 & 6 LANE STREET SECTIONS



FOUR LANE STREET



SIX LANE STREET

NOTE:

PAVEMENT SECTIONS TO BE MIN. 6" DEEPLIFT ASPHALTIC CONCRETE, UNLESS OTHERWISE SPECIFIED.

NO SCALE

DATE: JUNE 30, 1991

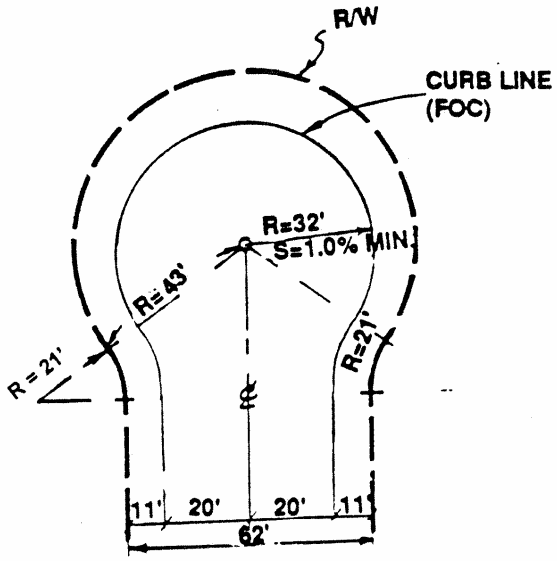
REV. DATE:

APPROVED BY:

DRWG. 2C

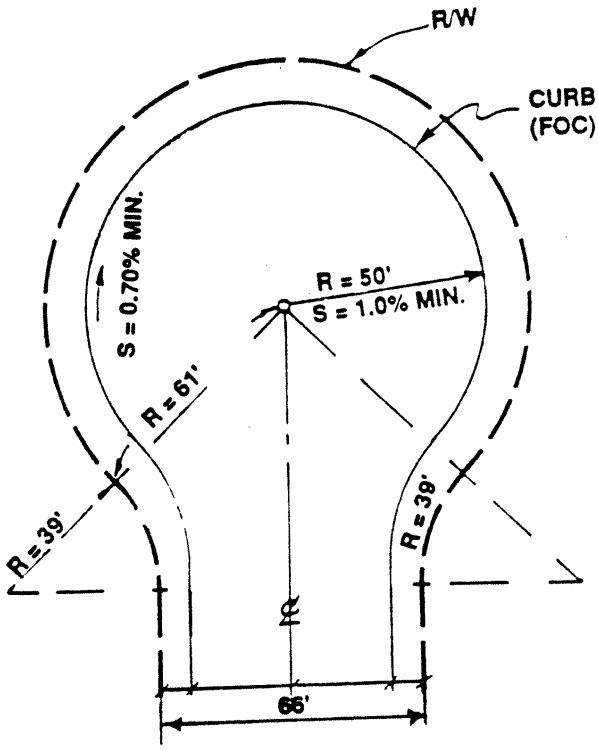
REV. MAY 1998

2000 STANDARD DETAILS



RESIDENTIAL

CURB RADIUS = 32'



INDUSTRIAL

CURB RADIUS = 50'

CUL DE SAC DETAILS

APPROVED BY:

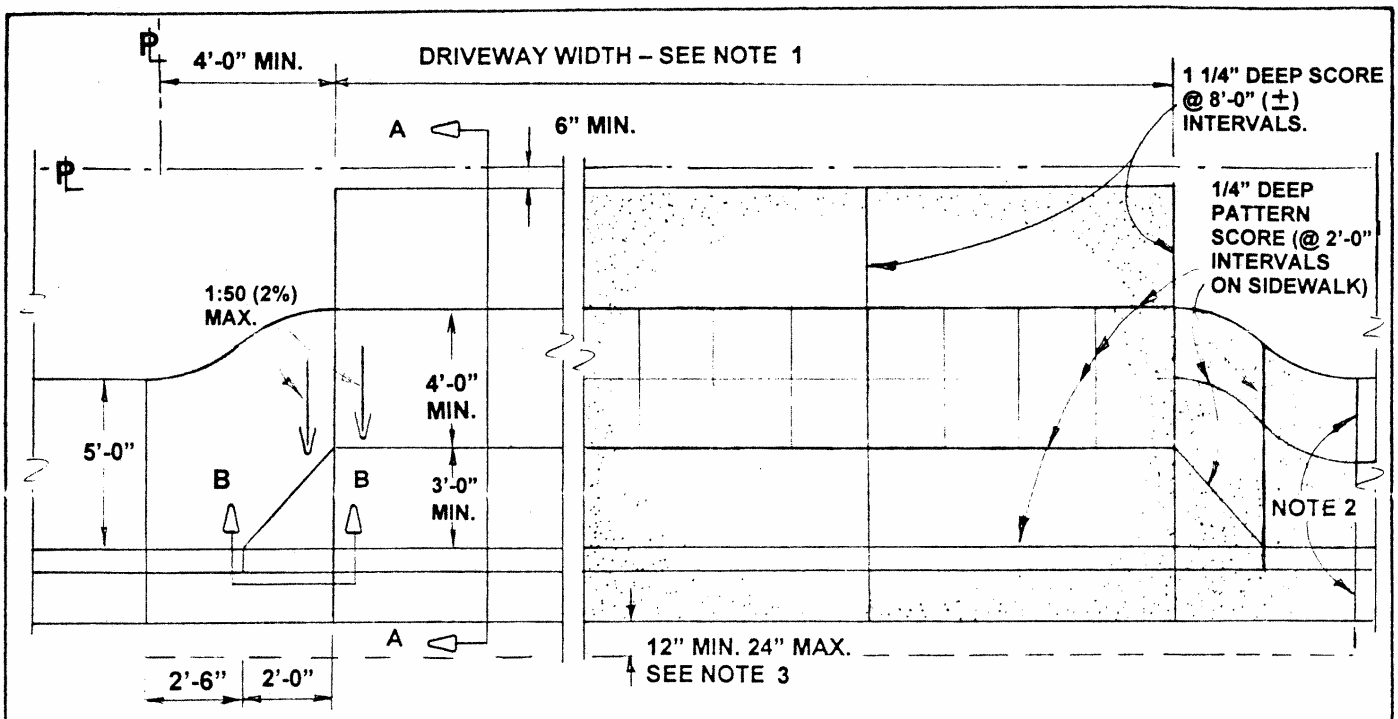
DATE: JUNE 30, 1991

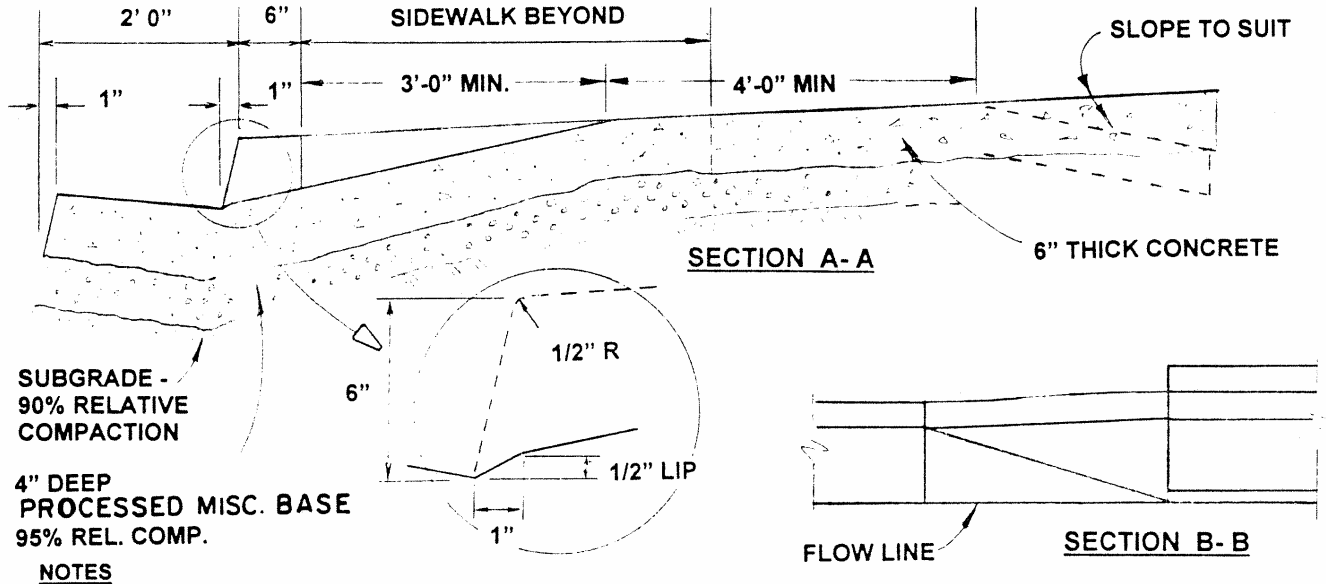
REV. DATE:

DRWG. 3C

2000 STANDARD DETAILS

REV. JULY 1998





NOTES

1. DRIVEWAY WIDTH. SINGLE 10'-0" MIN, 16'-0" MAX. DOUBLE 18'-0" MIN, 24'-0" MAX. WIDTH INCREMENTS SHALL BE IN MULTIPLES OF 2'-0". NOTE THAT FOR REQUIRED FIRE LANES, MINIMUM WIDTHS MAY BE GREATER.
   WIDTH INCREMENTS SHALL BE IN MULTIPLES OF 2'-0".
2. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT TO NEAREST SCORED JOINT OR CONTROL JOINT. INSTALL #4 DOWELS 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.
3. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT AC & REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF DRIVEWAY.
4. LIGHT BROOM FINISH ALL SURFACES.
5. MATCH EXISTING SCORE PATTERNS OR EXISTING JOINTS IN SIDEWALK. SOME VARIATION IN DIMENSIONING IS PERMITTED, PROVIDED SPECIFIED MAX/MIN SLOPES/DIMENSIONS ARE NOT VIOLATED.
6. IF RIGHT-OF-WAY WIDTH IS INSUFFICIENT TO ALLOW THE USE OF THIS DETAIL, STANDARD DETAIL 5C-2 MAY BE USED

RESIDENTIAL DRIVEWAY APPROACH IN MONOLITHIC CURB, GUTTER AND SIDEWALK. (1 OF 2)

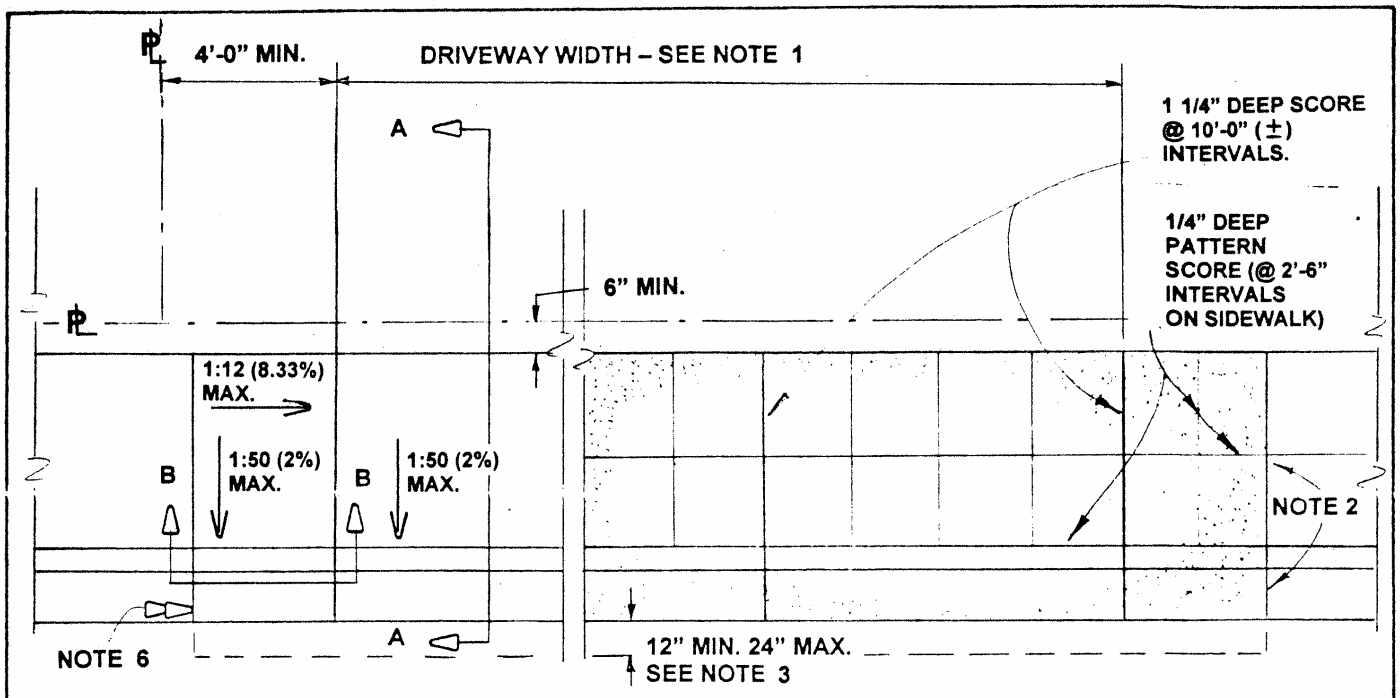
APPROVED BY: Maria A Rose

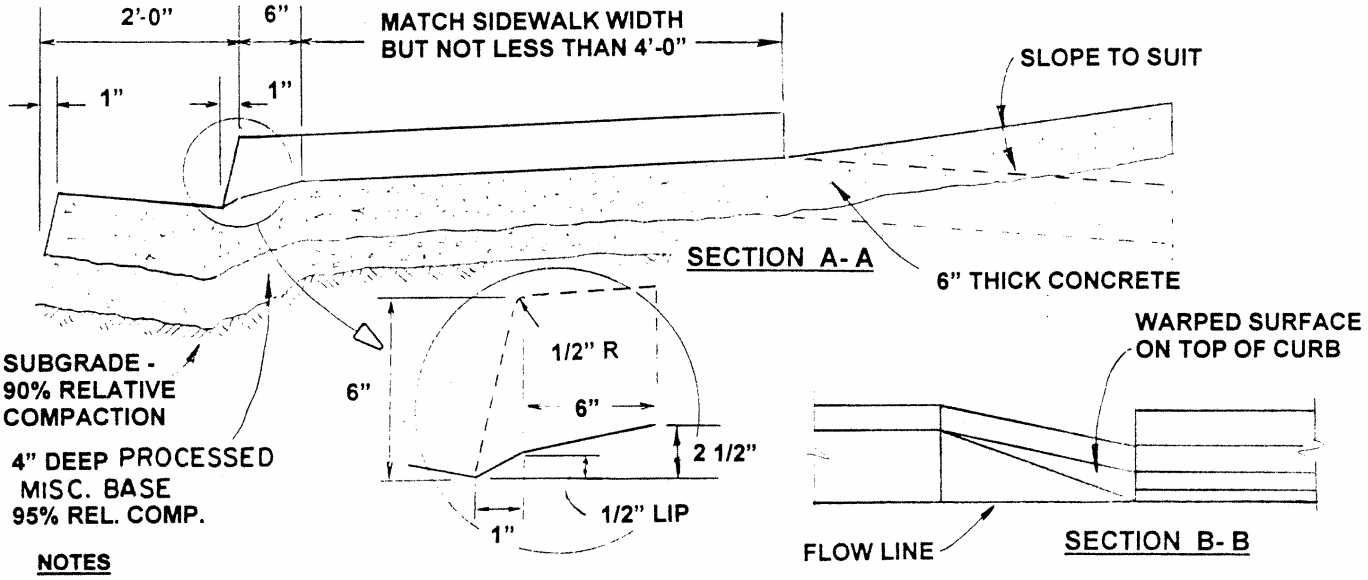
DATE JULY, 1998

REV. DATE JULY 2000

5C – 1

2000 STANDARD DETAILS





NOTES

1. DRIVEWAY WIDTH. SINGLE 10'-0" MIN, 15'-0" MAX. DOUBLE 17'-6" MIN, 25'-0" MAX. WIDTH INCREMENTS SHALL BE IN MULTIPLES OF 2'6". NOTE THAT FOR REQUIRED FIRE LANES, MINIMUM WIDTHS MAY BE GREATER.
2. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT TO NEAREST SCORED JOINT OR CONTROL JOINT. INSTALL #4 DOWELS 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.
3. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT AC & REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF DRIVEWAY.
4. LIGHT BROOM FINISH ALL SURFACES.
5. MATCH EXISTING SCORE PATTERNS OR EXISTING JOINTS IN SIDEWALK. SOME VARIATION IN DIMENSIONING IS PERMITTED, PROVIDED SPECIFIED MAX/MIN SLOPES/DIMENSIONS ARE NOT VIOLATED.
6. MIN. OF 4'-0" TO EDGE OF ADJACENT DRIVEWAY APPROACH.
7. THIS STANDARD DETAIL IS TO BE USED ONLY IF RIGHT-OF-WAY WIDTH IS INSUFFICIENT TO ALLOW THE USE OF STANDARD DETAIL 5C-1.

RESIDENTIAL DRIVEWAY APPROACH IN MONOLITHIC CURB, GUTTER AND SIDEWALK. (2 OF 2)

CITY OF SUNNYVALE, CALIFORNIA

Mar A. Ras

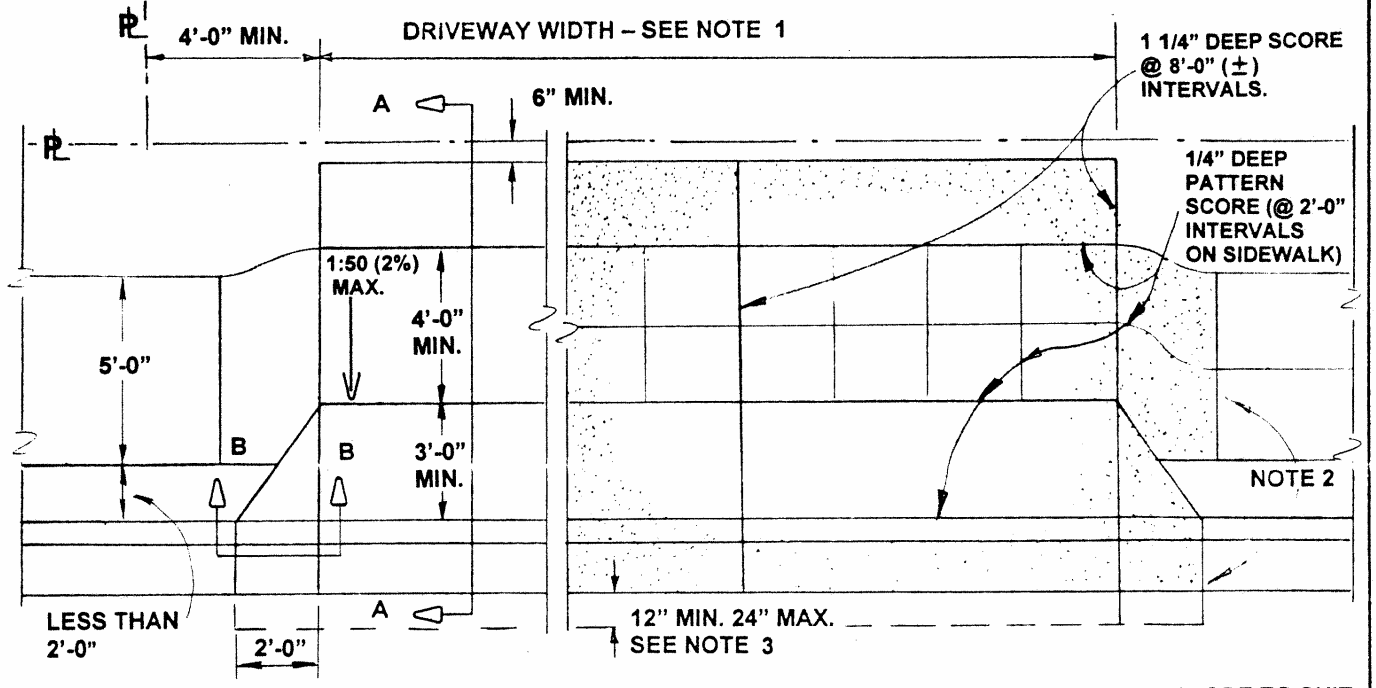
APPROVED BY:

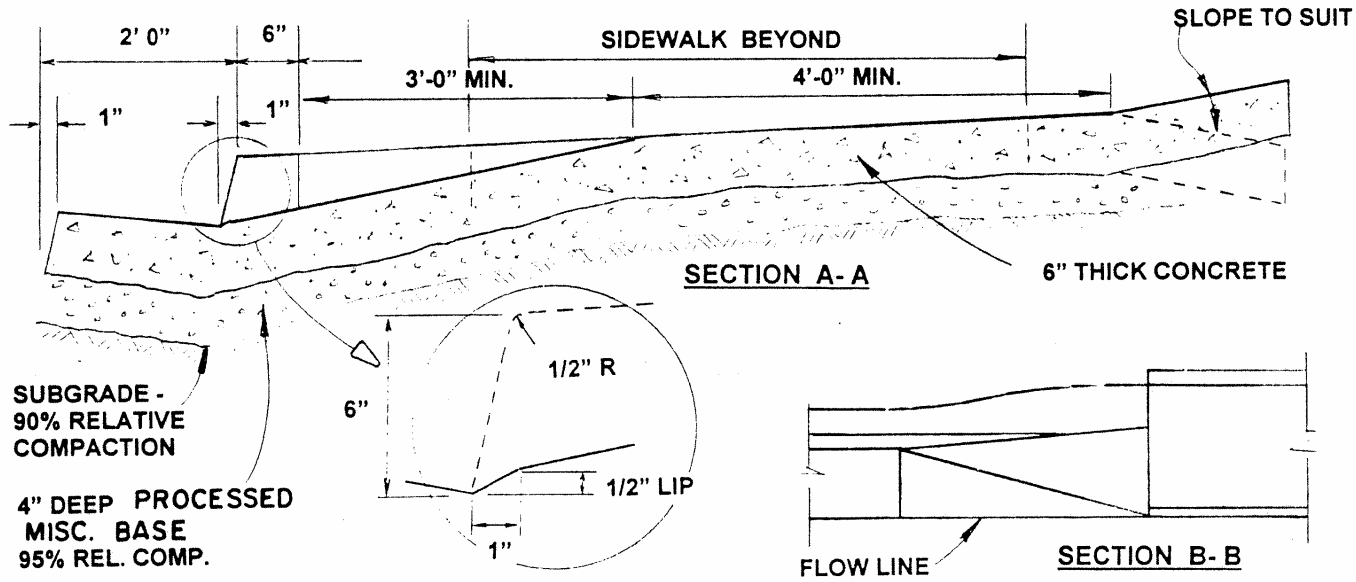
DATE JULY 1998

REV. DATE JULY 2000

5C – 2

2000 STANDARD DETAILS





NOTES

1. DRIVEWAY WIDTH. SINGLE 10'-0" MIN, 16'-0" MAX. DOUBLE 18'-0" MIN, 24'-0" MAX. WIDTH INCREMENTS SHALL BE IN MULTIPLES OF 2'-0". NOTE THAT FOR REQUIRED FIRE LANES, MINIMUM WIDTHS MAY BE GREATER.
2. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT TO NEAREST SCORED JOINT OR CONTROL JOINT. INSTALL #4 DOWELS 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.
3. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT AC & REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF DRIVEWAY.
4. LIGHT BROOM FINISH ALL SURFACES.
5. MATCH EXISTING SCORE PATTERNS OR EXISTING JOINTS IN SIDEWALK. SOME VARIATION IN DIMENSIONING IS PERMITTED, PROVIDED SPECIFIED MAX/MIN SLOPES/DIMENSIONS ARE NOT VIOLATED.

RESIDENTIAL DRIVEWAY APPROACH IN NON-MONOLITHIC CURB, GUTTER AND SIDEWALK, WITH PARK- STRIP LESS THAN 2'-0" WIDE.

CITY OF SUNNYVALE CALIFORNIA

Monzi A. Rao

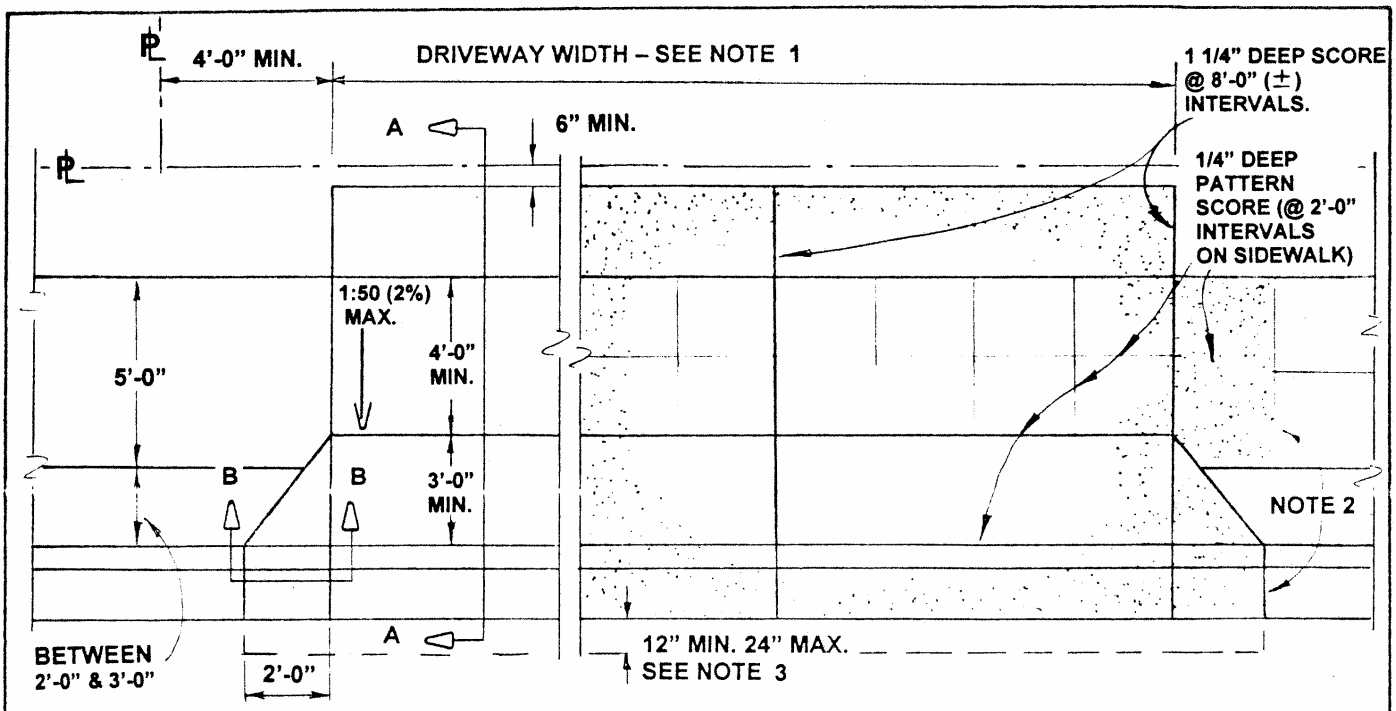
APPROVED BY:

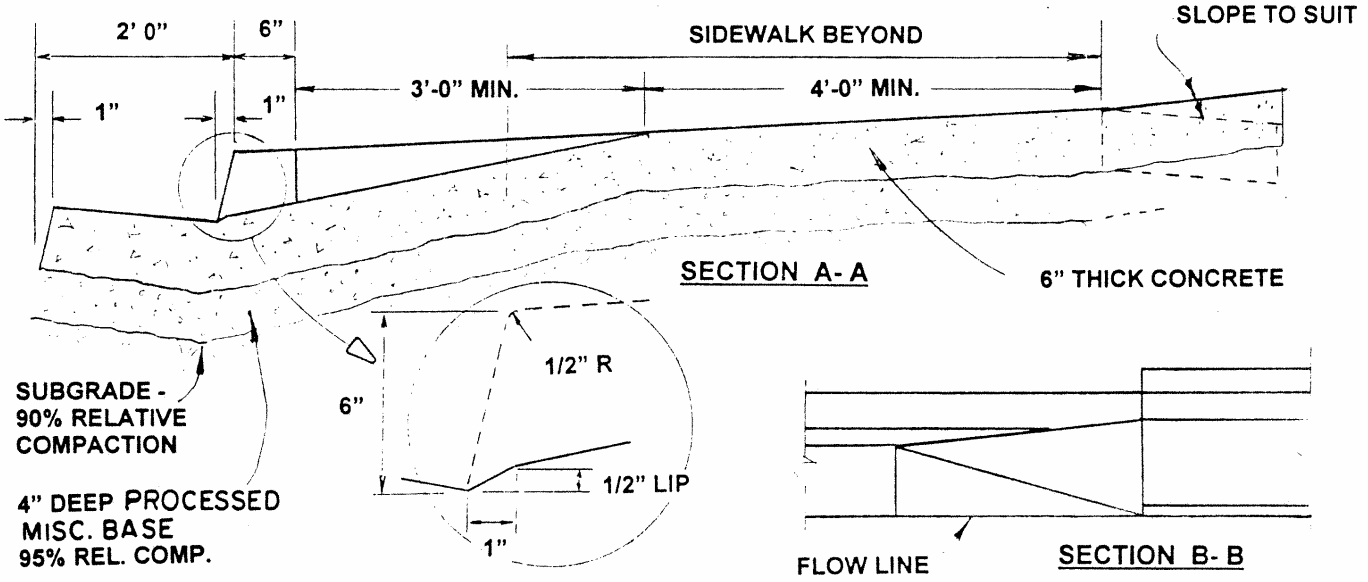
DATE

REV. DATE JULY 2000

DRWG. 5C – 3

2000 STANDARD DETAILS





NOTES

1. DRIVEWAY WIDTH. SINGLE 10'-0" MIN, 16'-0" MAX. DOUBLE 18'-0" MIN, 24'-0" MAX. WIDTH INCREMENTS SHALL BE IN MULTIPLES OF 2'-0". NOTE THAT FOR REQUIRED FIRE LANES, MINIMUM WIDTHS MAY BE GREATER.
2. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT TO NEAREST SCORED JOINT OR CONTROL JOINT. INSTALL #4 DOWELS 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.
3. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT AC & REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF DRIVEWAY.
4. LIGHT BROOM FINISH ALL SURFACES.
5. MATCH EXISTING SCORE PATTERNS OR EXISTING JOINTS IN SIDEWALK. SOME VARIATION IN DIMENSIONING IS PERMITTED, PROVIDED SPECIFIED MAX/MIN SLOPES/DIMENSIONS ARE NOT VIOLATED.

RESIDENTIAL DRIVEWAY APPROACH IN NON-MONOLITHIC CURB, GUTTER AND SIDEWALK, WITH PARK- STRIP WIDTH GREATER THAN 2'-0" BUT LESS THAN 3'-0".

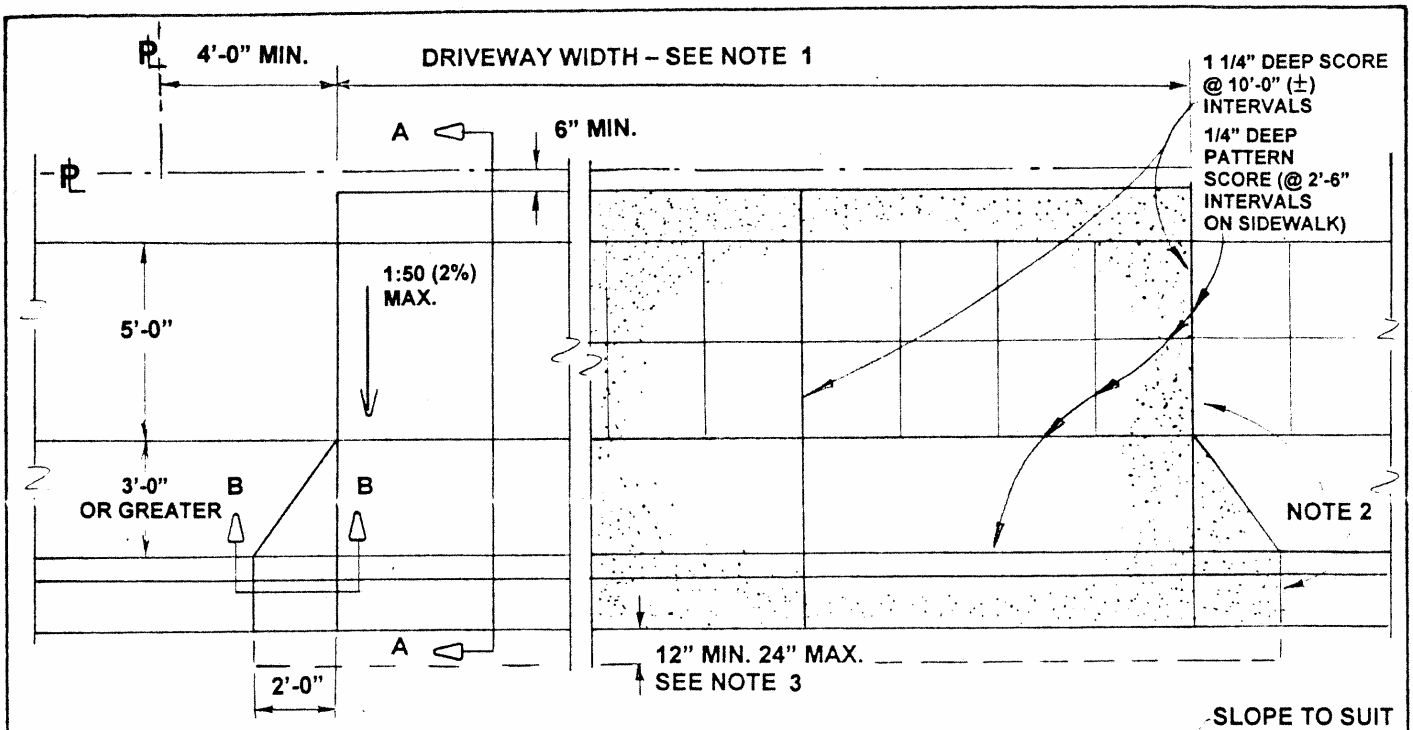
APPROVED BY: Marc A. Ra

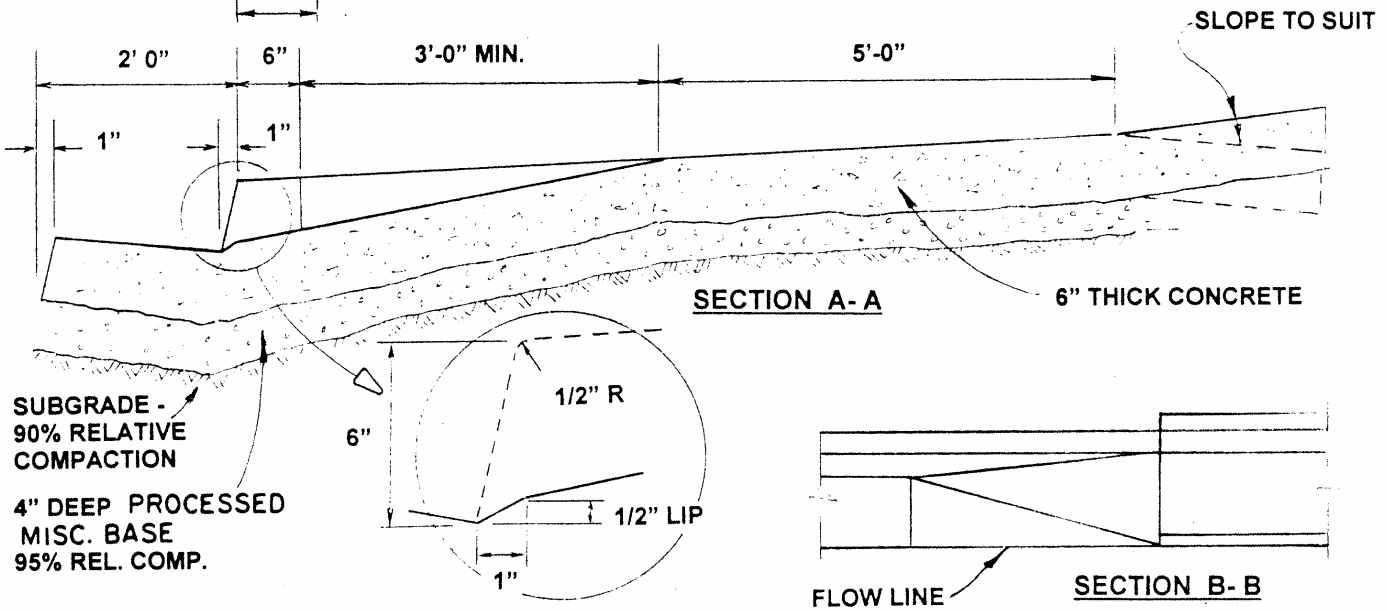
DATE JULY 1998

REV. DATE JULY 2000

5C – 4

2000 STANDARD DETAILS





NOTES

1. DRIVEWAY WIDTH. SINGLE 10'-0" MIN, 15'-0" MAX. DOUBLE 17'-6" MIN, 25'-0" MAX. WIDTH INCREMENTS SHALL BE IN MULTIPLES OF 2'-6". NOTE THAT FOR REQUIRED FIRE LANES, MINIMUM WIDTHS MAY BE GREATER.
2. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT TO NEAREST SCORED JOINT OR CONTROL JOINT. INSTALL #4 DOWELS 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.
3. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT AC & REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF DRIVEWAY.
4. LIGHT BROOM FINISH ALL SURFACES.
5. MATCH EXISTING SCORE PATTERNS OR EXISTING JOINTS IN SIDEWALK. SOME VARIATION IN DIMENSIONING IS PERMITTED, PROVIDED SPECIFIED MAX/MIN SLOPES/DIMENSIONS ARE NOT VIOLATED.

RESIDENTIAL DRIVEWAY APPROACH IN NON-MONOLITHIC CURB, GUTTER AND SIDEWALK, WITH PARK STRIP GREATER THAN 3'-0" WIDE.

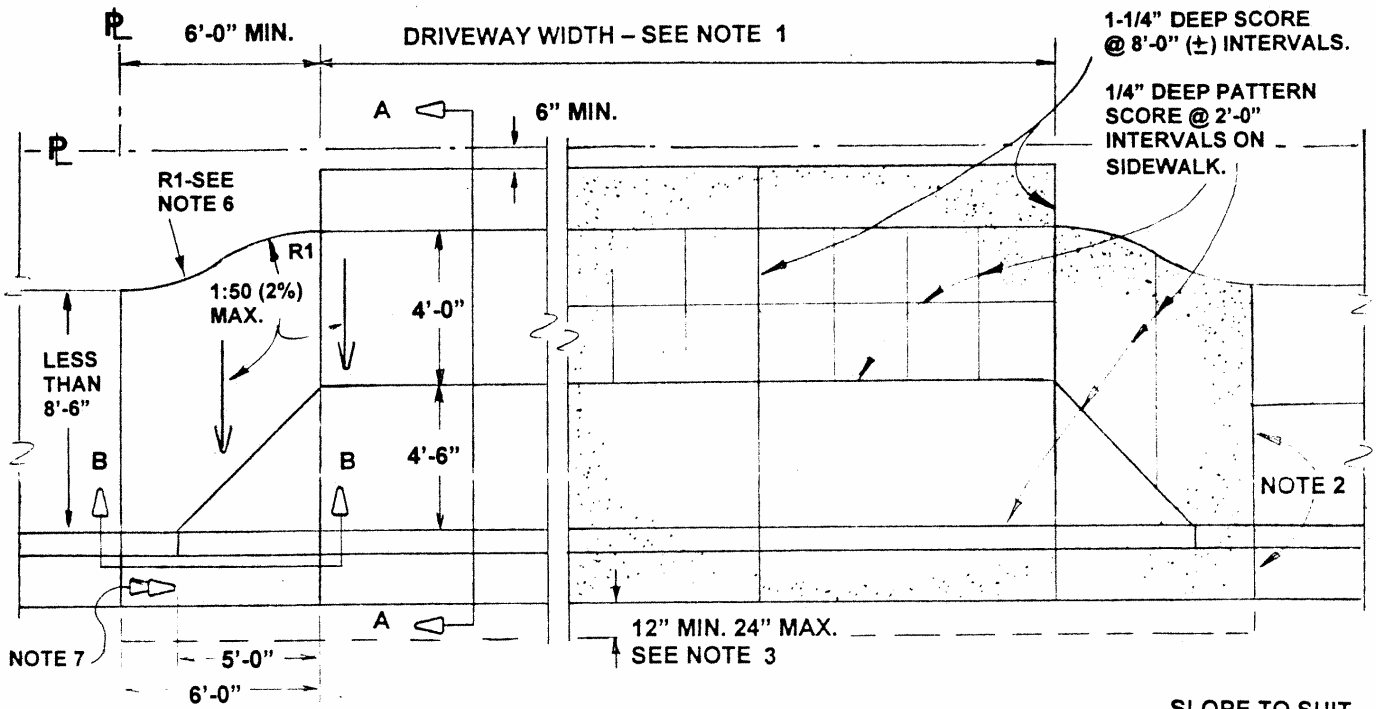
CITY OF SUNNYVALE, CALIFORNIA

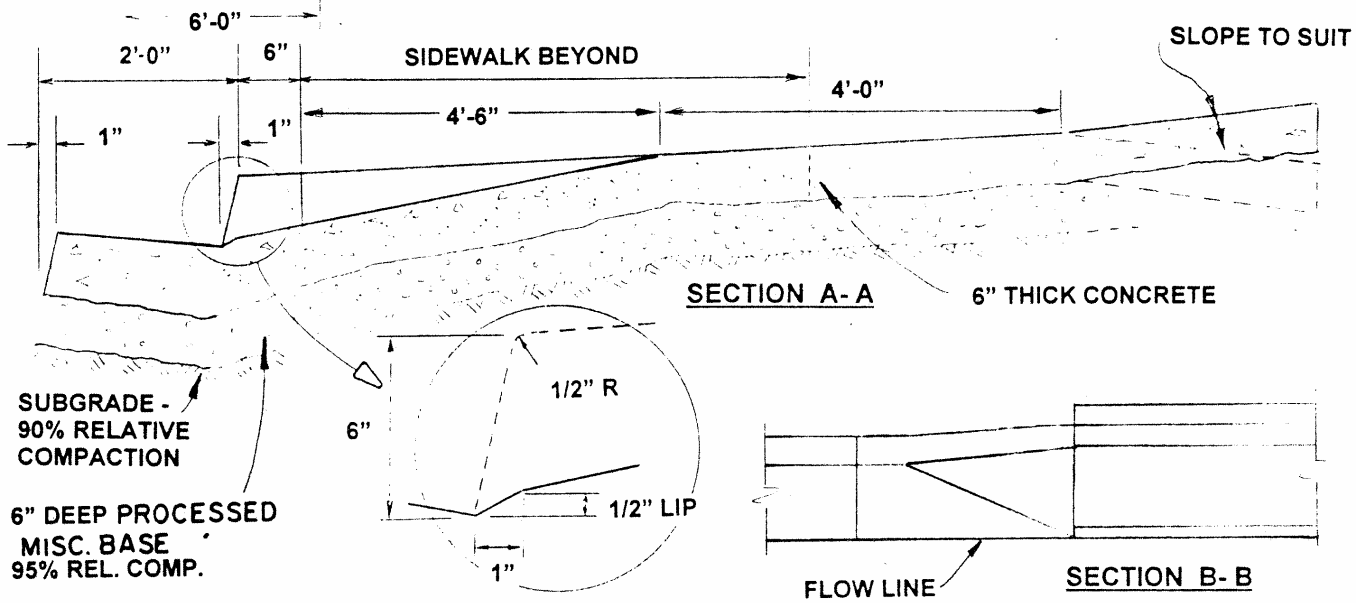
Marvin A. Rose
APPROVED BY:

DATE JULY 1998
REV. DATE JULY 2000

5C – 5

2000 STANDARD DETAILS





NOTES

1. DRIVEWAY WIDTH. SINGLE 12'-0" MIN, 18'-0" MAX. DOUBLE 20'-0" MIN, 42'-0" MAX. WIDTH INCREMENTS SHALL BE IN MULTIPLES OF 2'-0". NOTE THAT FOR REQUIRED FIRE LANES, MINIMUM WIDTHS MAY BE GREATER.
2. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT TO NEAREST SCORED JOINT OR CONTROL JOINT. INSTALL #4 DOWELS 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.
3. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT AC & REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF DRIVEWAY.
4. LIGHT BROOM FINISH ALL SURFACES.
5. MATCH EXISTING SCORE PATTERNS OR EXISTING JOINTS IN SIDEWALK. SOME VARIATION IN DIMENSIONING IS PERMITTED, PROVIDED SPECIFIED MAX/MIN SLOPES/DIMENSIONS ARE NOT VIOLATED.
6. R1 IS A FUNCTION OF EXISTING SIDEWALK WIDTH. SELECT TO CREATE SMOOTH TRANSITION.
7. MIN. OF 4'-0" TO EDGE OF FLARE OF ADJACENT DRIVEWAY APPROACH.

COMMERCIAL AND INDUSTRIAL DRIVEWAY APPROACH IN MONOLITHIC CURB, GUTTER, AND SIDEWALK, LESS THAN 8'- 6" WIDE.

CITY OF SUNNYVALE, SILICON VALLEY

Marvin A. Rose

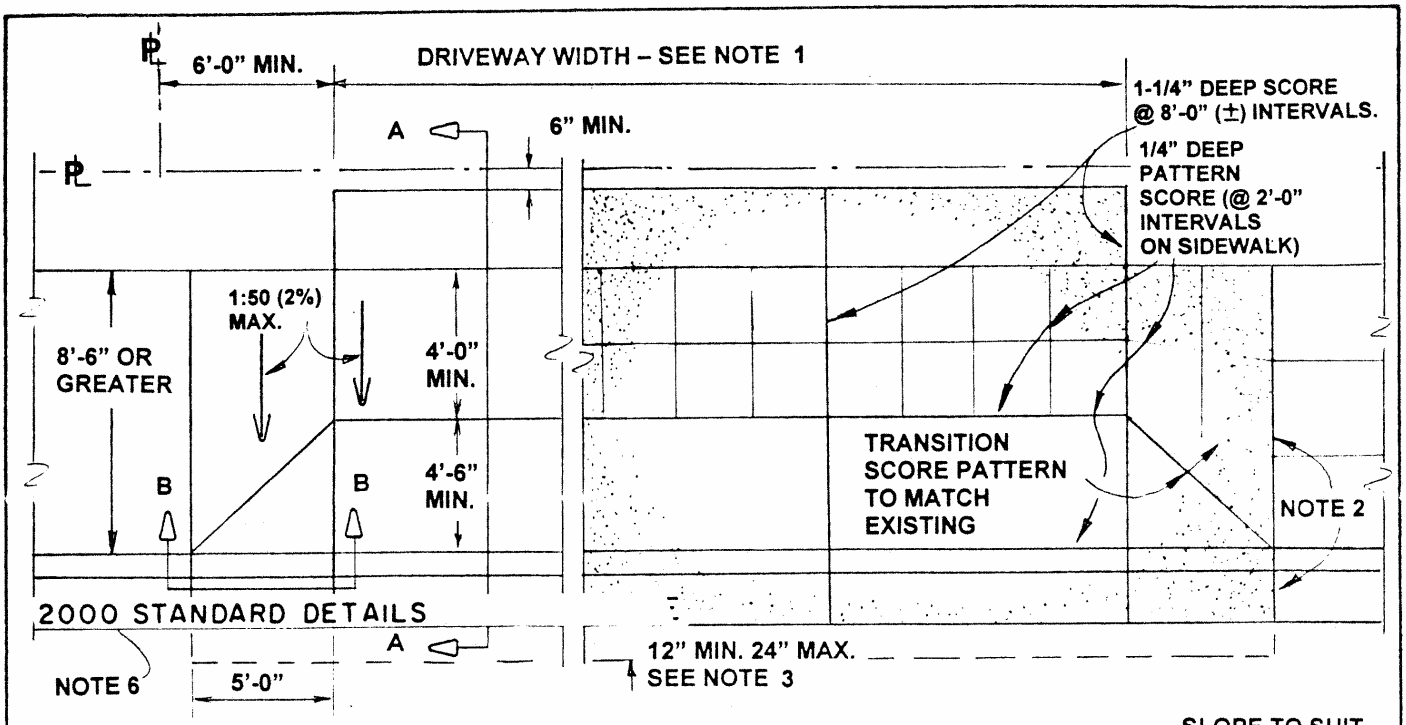
APPROVED BY:

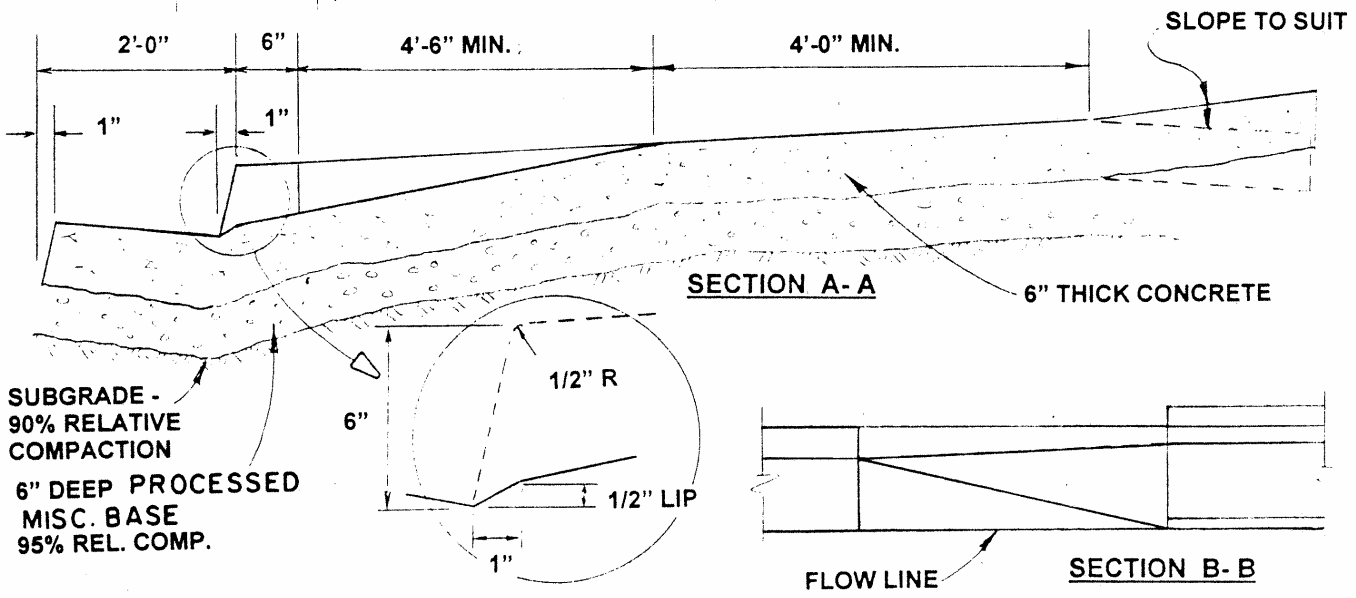
DATE JULY 1998

REV. DATE JULY 2000

6C – 1

2000 STANDARD DETAILS





NOTES

1. DRIVEWAY WIDTH. SINGLE 12'-0" MIN, 18'-0" MAX. DOUBLE 20'-0" MIN, 42'-0" MAX. WIDTH INCREMENTS SHALL BE IN MULTIPLES OF 2'-0". NOTE THAT FOR REQUIRED FIRE LANES, MINIMUM WIDTHS MAY BE GREATER.
2. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT TO NEAREST SCORED JOINT OR CONTROL JOINT. INSTALL #4 DOWELS 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.
3. IF CONSTRUCTING NEW DRIVEWAY IN EXISTING CURB, GUTTER & SIDEWALK, SAWCUT AC & REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF DRIVEWAY.
4. LIGHT BROOM FINISH ALL SURFACES.
5. MATCH EXISTING SCORE PATTERNS OR EXISTING JOINTS IN SIDEWALK. SOME VARIATION IN DIMENSIONING IS PERMITTED, PROVIDED SPECIFIED MAX/MIN SLOPES/DIMENSIONS ARE NOT VIOLATED.
6. MIN. OF 4'-0" TO EDGE OF FLARE OF ADJACENT DRIVEWAY APPROACH.

COMMERCIAL AND INDUSTRIAL DRIVEWAY APPROACH IN MONOLITHIC CURB, GUTTER, AND SIDEWALK, GREATER THAN 8'- 6" WIDE.

CITY OF SUNNYVALE CALIFORNIA

Mowri A. Rao

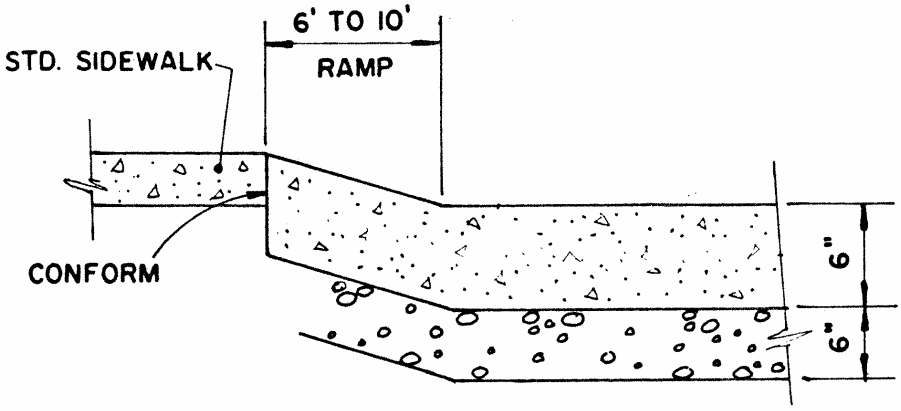
APPROVED BY:

DATE JULY 1998

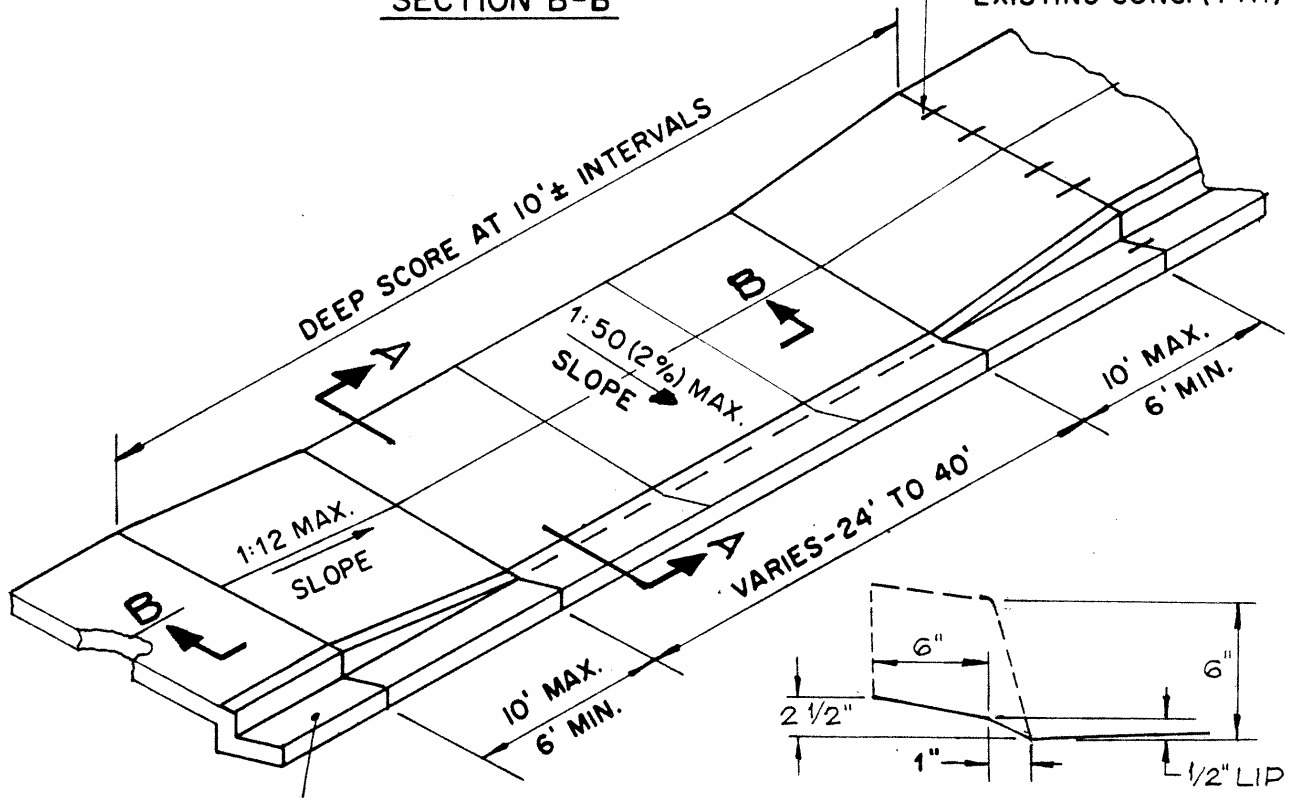
REV.DATE JULY 2000

6C – 2

2000 STANDARD DETAILS

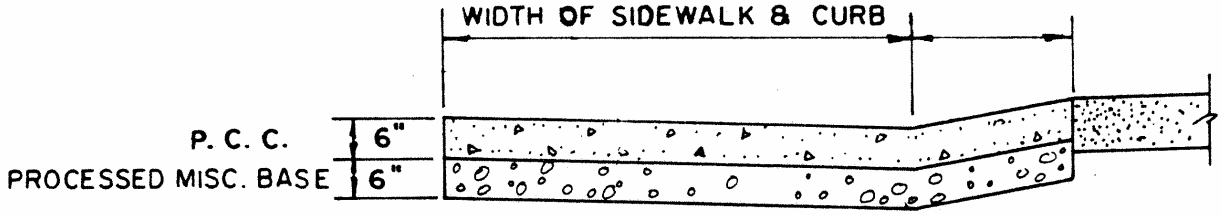


SECTION B-B



STD. CURB & GUTTER

D/W GUTTER DETAIL



SECTION A-A

COMMERCIAL AND INDUSTRIAL DRIVEWAY-SIDEWALK RAMP TYPE

(FOR USE IN AREAS W/RESTRICTED RIGHT-OF-WAY)

CITY OF SUNNYVALE CALIFORNIA

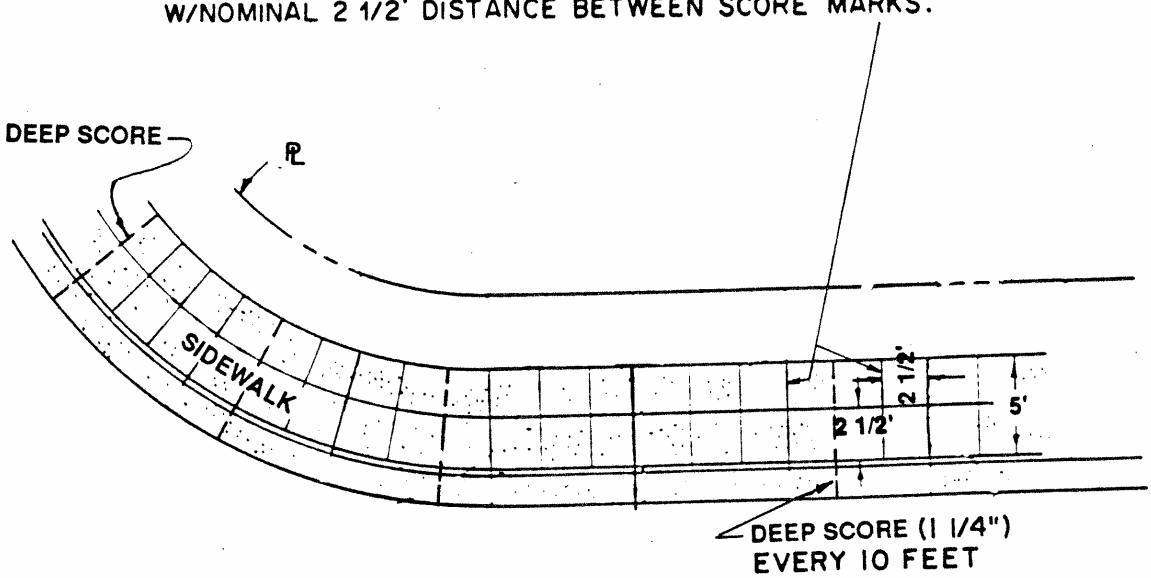
APPROVED

DATE JUNE 22, 2000

REV. DATE

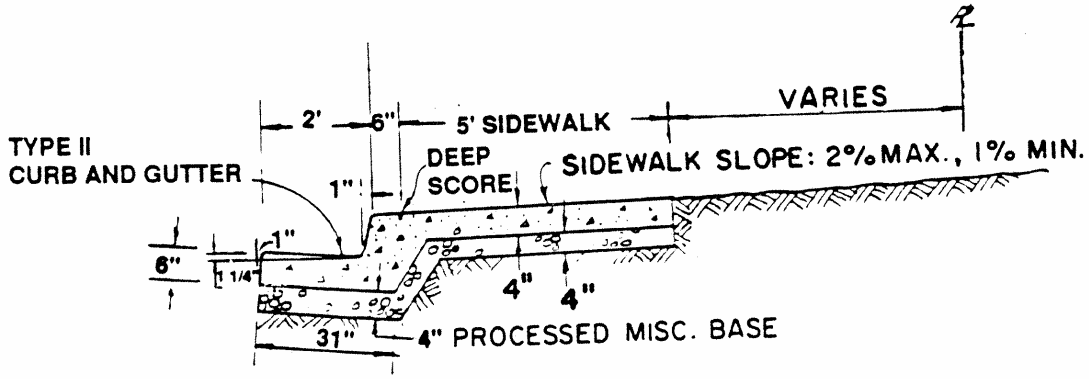
6C-3

2000 STANDARD DETAILS



PLAN VIEW

NO SCALE



SECTION

NOTE: SEE STANDARD DETAILS 13F & 14F FOR INSTALLATION OF ROOT BARRIER, IF CITY DETERMINES ROOT BARRIER IS NECESSARY.

WHEN REPLACING EXISTING CURB W/NEW REPLACE PRE-EXISTING CURB MARKS & PAINT (ESPECIALY THOSE MARKS IDENTIFYING SEWER OR VALVE FEATURES).

MONOLITHIC CURB, GUTTER & SIDEWALK SECTION

CITY OF SUNNYVALE CALIFORNIA

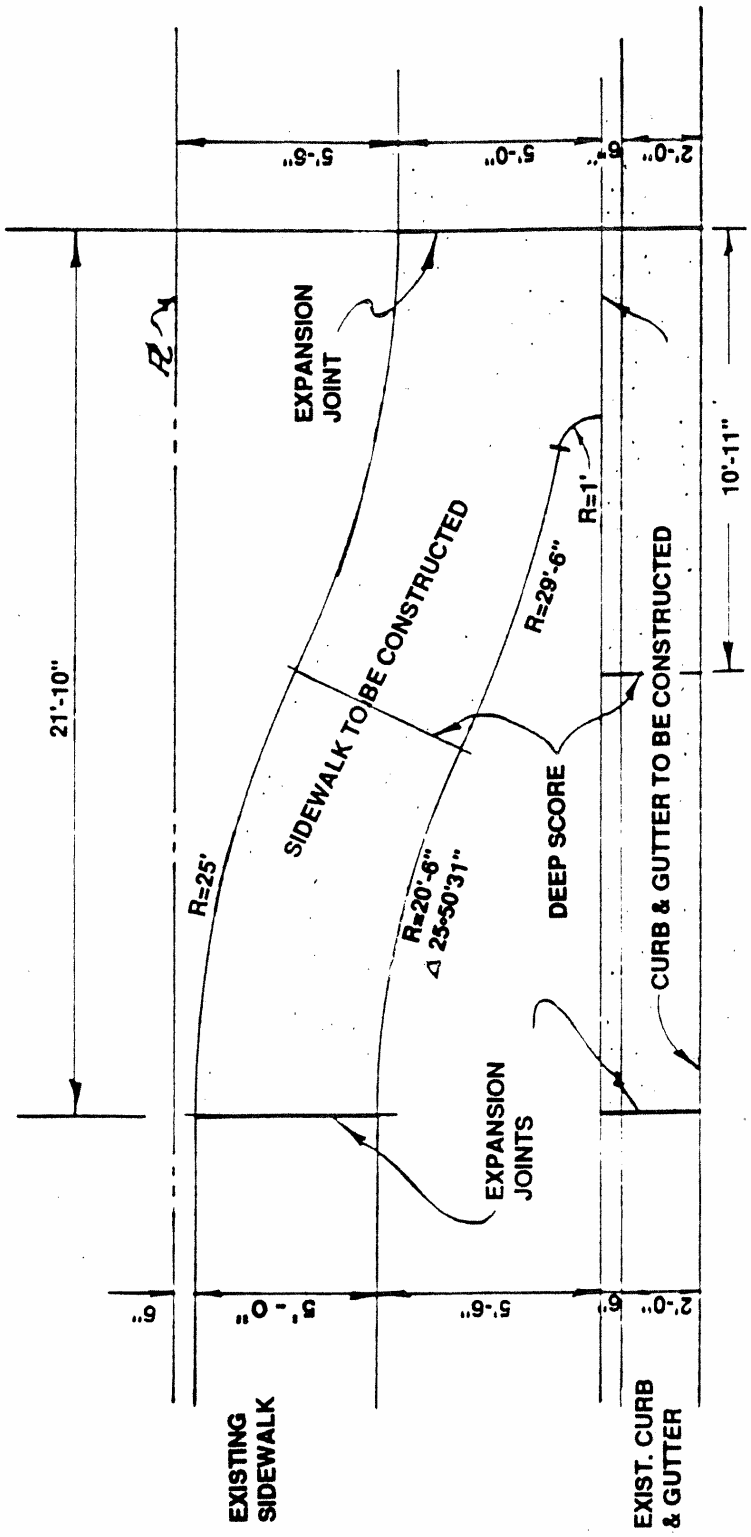
Marvin A. Rose
APPROVED BY:

DATE AUG. 1997

REV. DATE JULY 2000

DRWG. 9C

2000 STANDARD DETAILS



NOTE: SEE STANDARD DETAILS 13F & 14F FOR INSTALLATION OF ROOT BARRIER, IF CITY DETERMINES ROOT BARRIER IS NECESSARY

SIDEWALK TRANSITION DETAIL

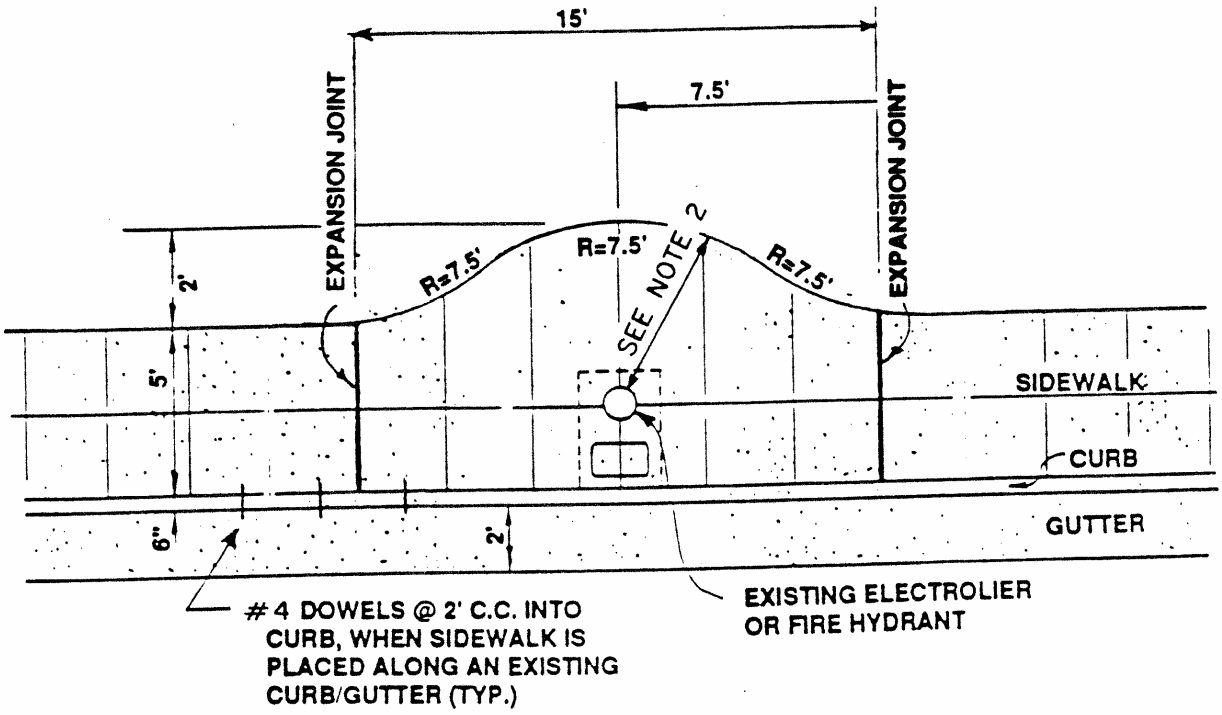
APPROVED BY: Mawn A. Rose

DATE: JUNE 30, 1991

REV. DATE: JULY 2000

DRWG. 10C

2000 STANDARD DETAILS



NOTE:

1. SEE STD. DETAILS 13F & 14F FOR INSTALLATION OF ROOT BARRIER, IF CITY DETERMINES ROOT BARRIER IS NECESSARY.
2. DIMENSIONS RELATING TO BACK OF SIDEWALK MAY NEED TO BE ADJUSTED & ENSURE A MINIMUM 4'-0" CLEARANCE

SIDEWALK TRANSITION AROUND EXISTING ELECTROLIERS OR FIRE HYDRANT

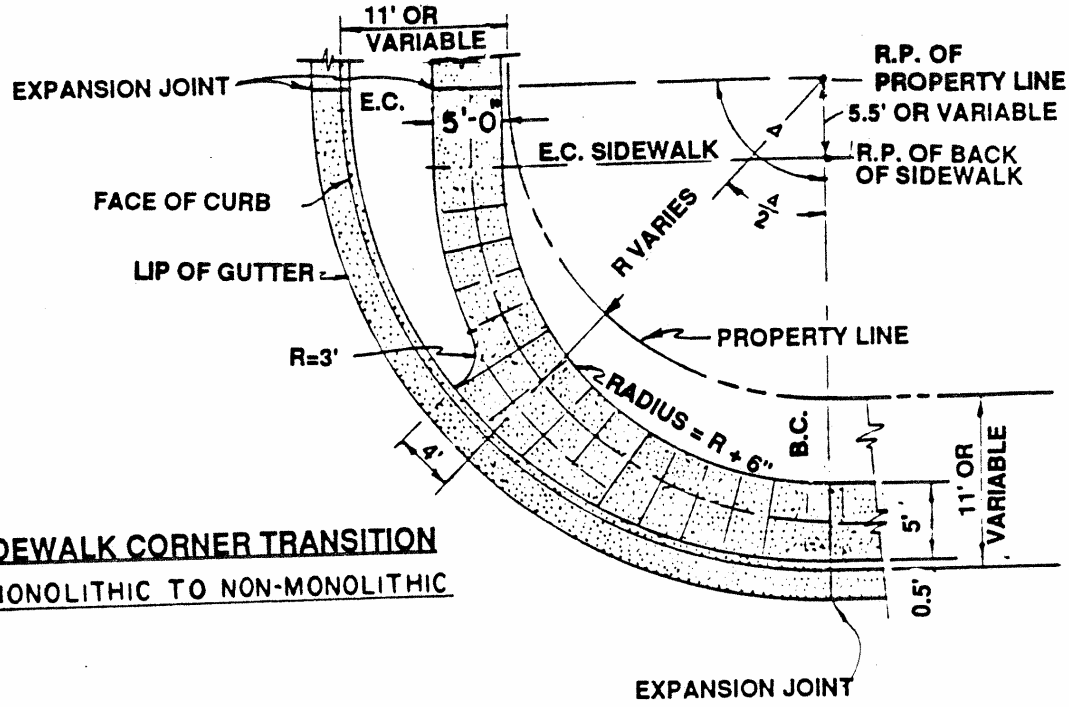
APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 2000

DRWG. 11C

2000 STANDARD DETAILS



SIDEWALK CORNER TRANSITION

MONOLITHIC TO NON-MONOLITHIC

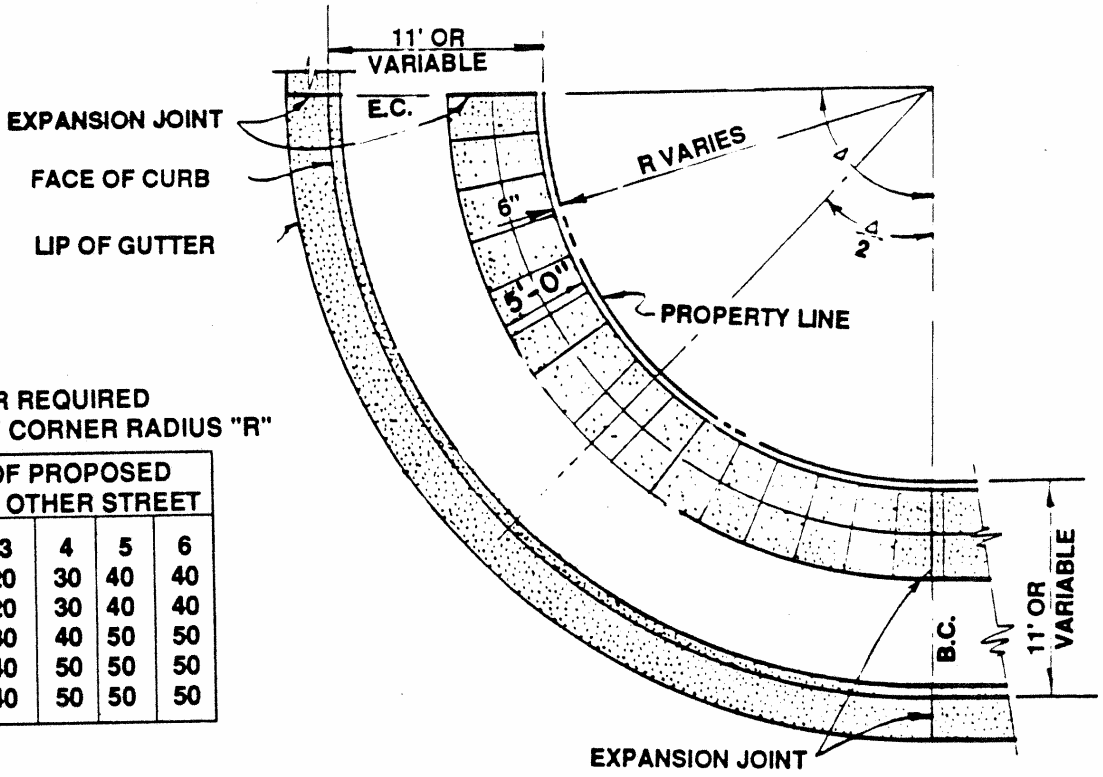


CHART FOR REQUIRED PROPERTY CORNER RADIUS "R"

NUMBER OF PROPOSED LANES ON OTHER STREET	NUMBER OF PROPOSED LANES ON OTHER STREET					
	2	3	4	5	6
2	20	20	30	40	40
3	20	20	30	40	40
4	30	30	40	50	50
5	40	40	50	50	50
6	40	40	50	50	50

NOTES:

1. 30' MIN. RADIUS FOR INDUSTRIAL
2. THIS DRAWING DOES NOT ADDRESS CURB RAMP REQUIREMENTS AT STREET INTERSECTIONS.
3. SEE STANDARD DETAILS 13F & 14F FOR INSTALLATION OF ROOT BARRIER, IF CITY DETERMINES ROOT BARRIER IS NECESSARY.

SIDEWALK INTERSECTION

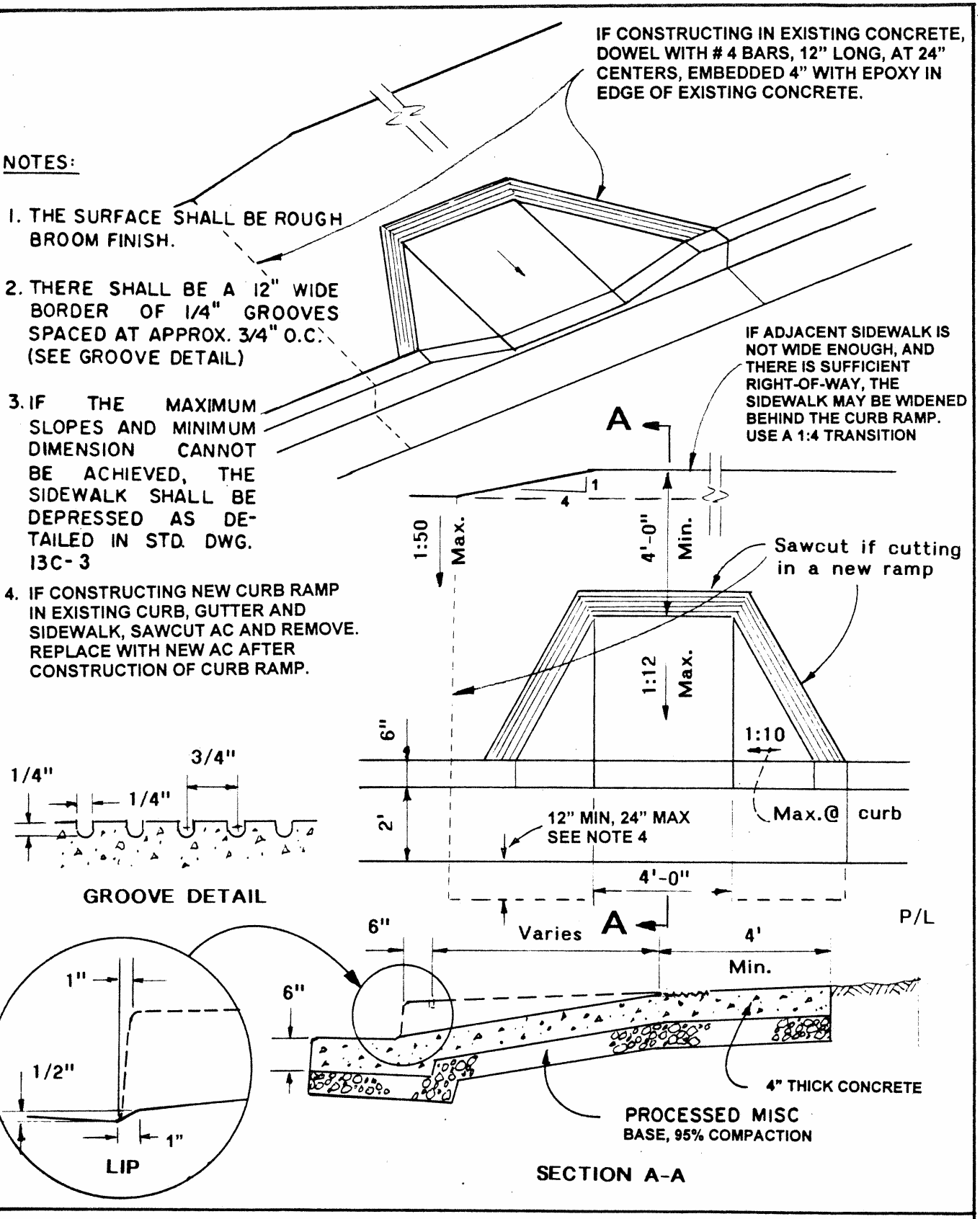
APPROVED BY: Mawn A. Rose

DATE JUNE 30, 1991

PREV. DATE JULY 2000

DRWG. 12C

2000 STANDARD DETAILS



PERPENDICULAR CURB RAMP
EXTRA WIDE SIDEWALK

Approved By:

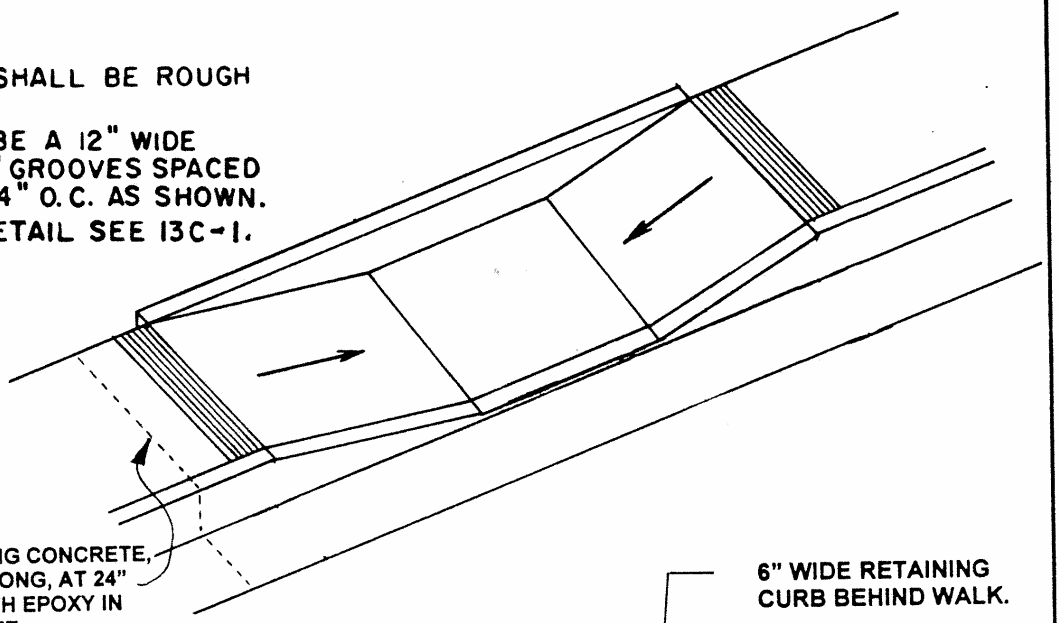
DATE
REV. DATE JULY 2000

Dwg. 13C-1

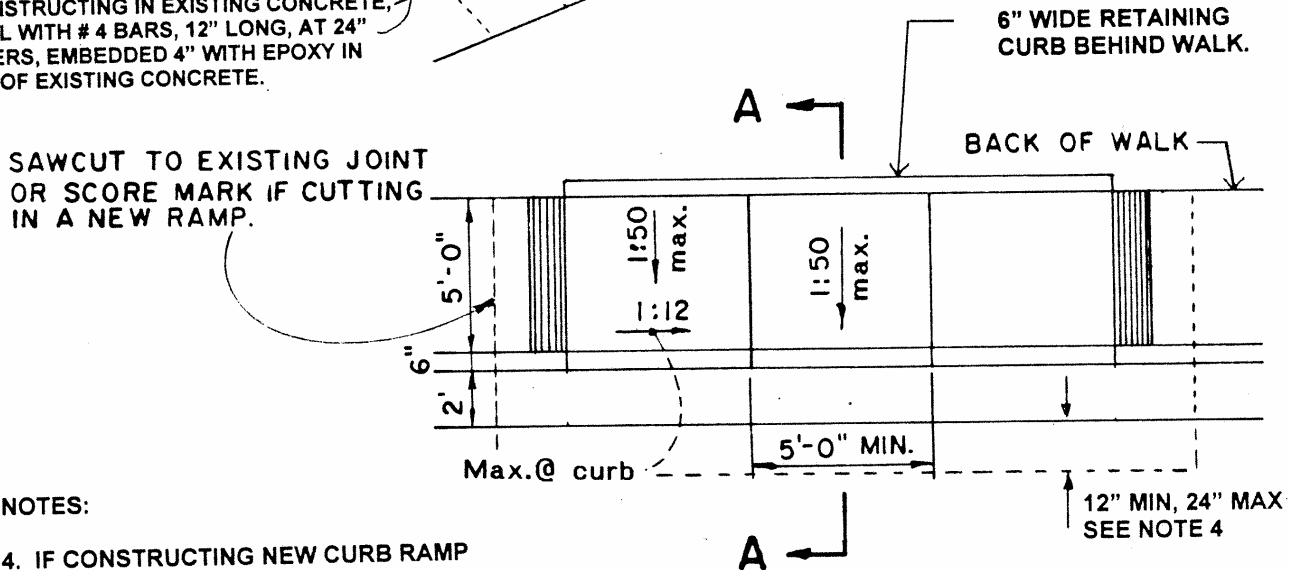
2000 STANDARD DETAILS

NOTES:

1. THE SURFACE SHALL BE ROUGH BROOM FINISH.
2. THERE SHALL BE A 12" WIDE BORDER OF 1/4" GROOVES SPACED AT APPROX. 3/4" O.C. AS SHOWN.
3. FOR GROOVE DETAIL SEE 13C-1.



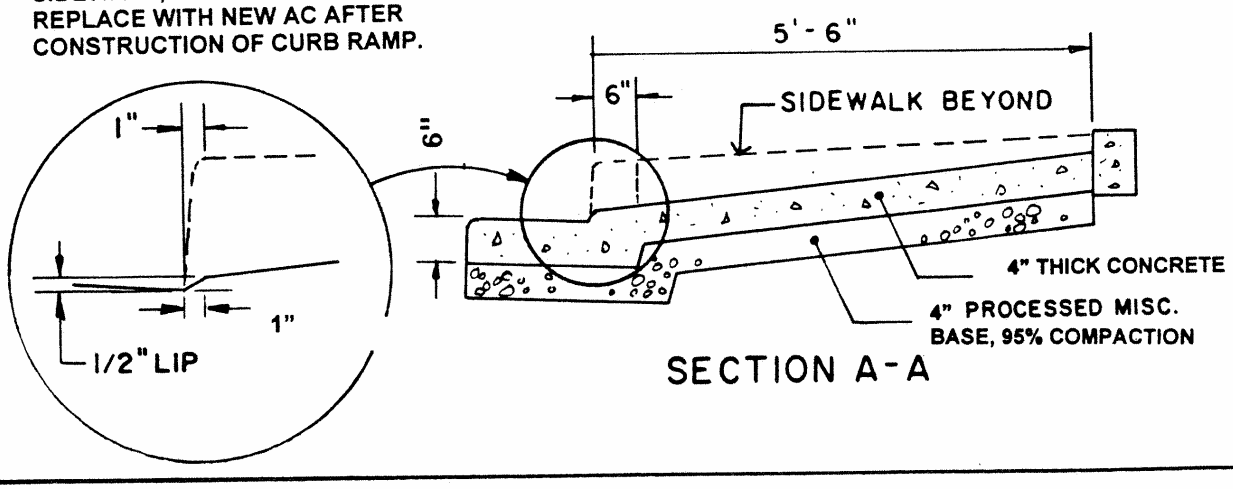
IF CONSTRUCTING IN EXISTING CONCRETE, DOWEL WITH # 4 BARS, 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.



PLAN VIEW

NOTES:

4. IF CONSTRUCTING NEW CURB RAMP IN EXISTING CURB, GUTTER AND SIDEWALK, SAWCUT AC AND REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF CURB RAMP.



SECTION A-A

PARALLEL CURB RAMP
MONOLITHIC SIDEWALK

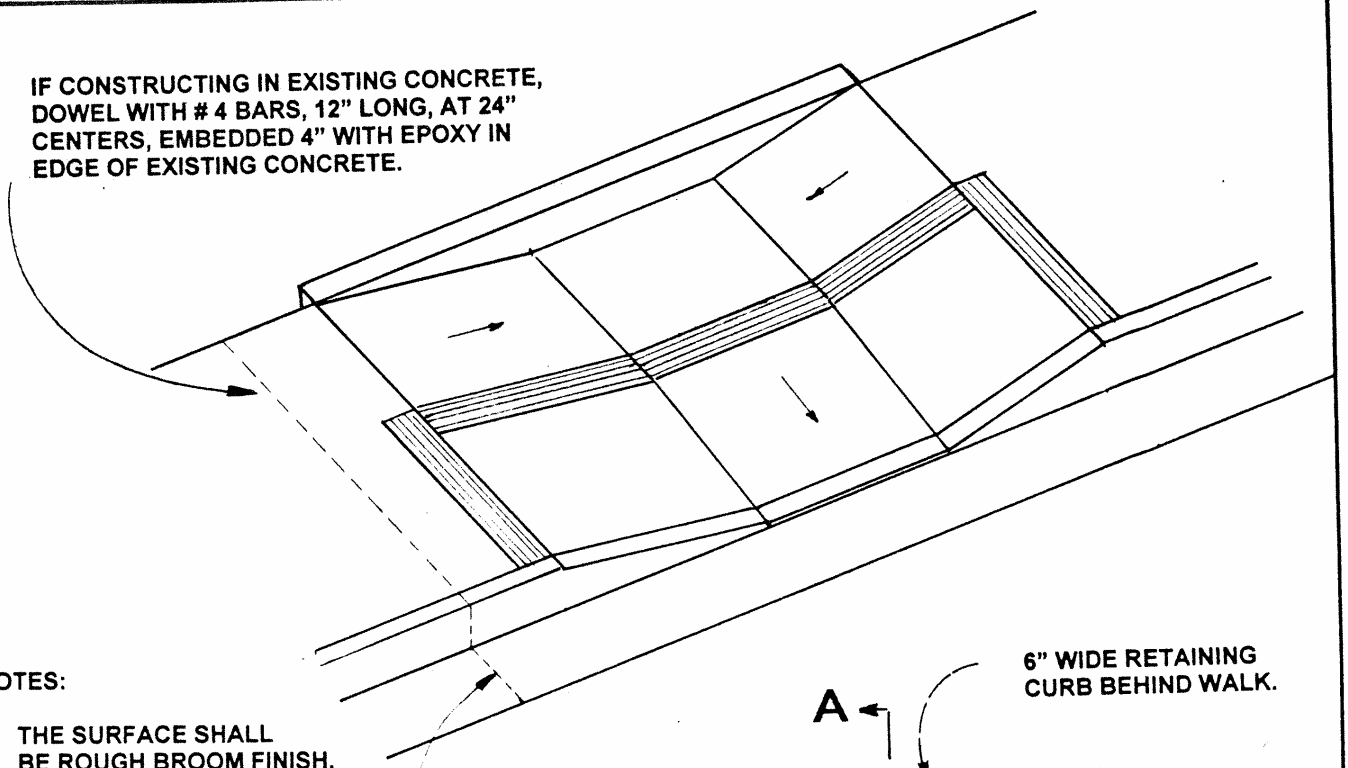
APPROVED BY: Marvin A Rose

DATE: Aug., 1997

REV. DATE: JULY 2000

13C-2

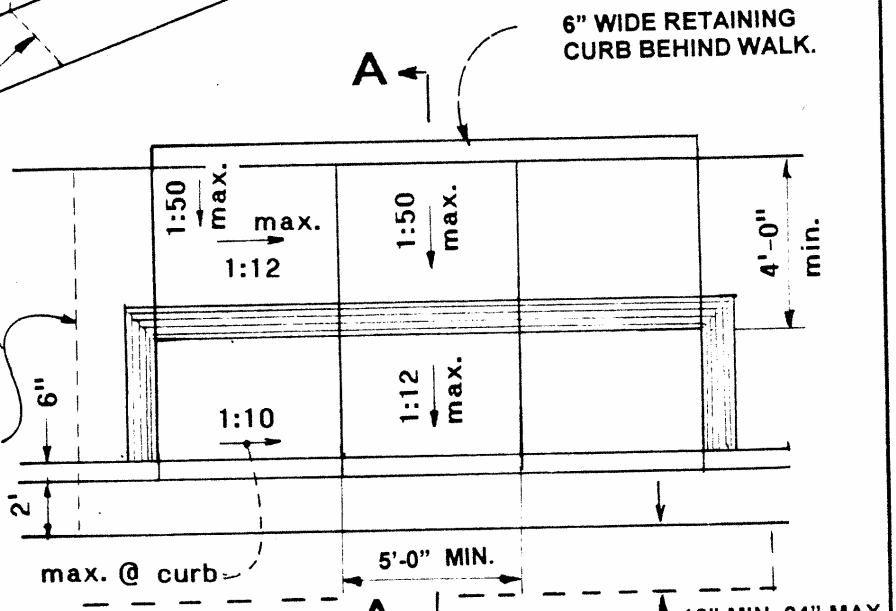
2000 STANDARD DETAILS

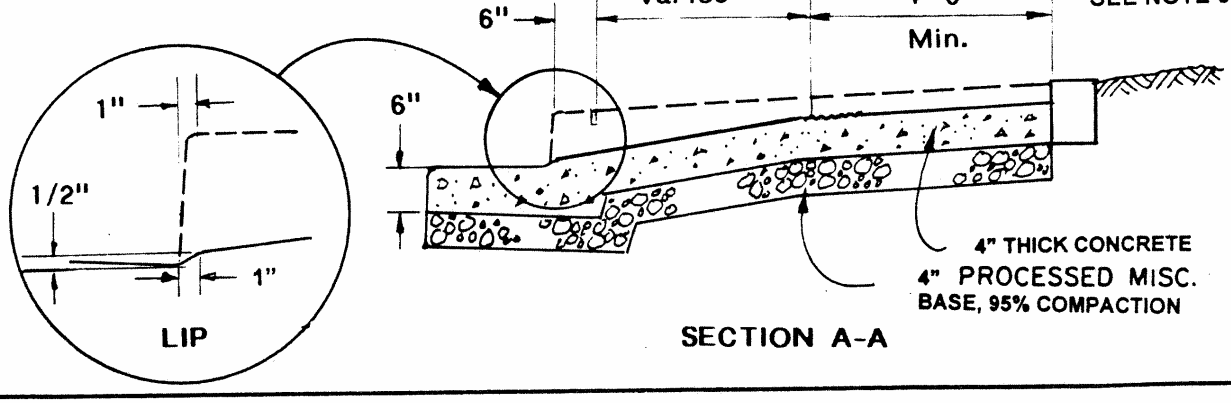


NOTES:

1. THE SURFACE SHALL BE ROUGH BROOM FINISH.
2. FOR GROOVE DETAILS, SEE STD DRAWING 13C-1.
3. IF CONSTRUCTING NEW CURB RAMP IN EXISTING CURB, GUTTER AND SIDEWALK, SAWCUT AC AND REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF CURB RAMP.

Sawcut to exist. joint or score pattern if cutting in a new ramp.





SECTION A-A

COMBINED PARALLEL/PERPENDICULAR CURB RAMP

EXTRA WIDE SIDEWALK

CITY OF SUNNYVALE, CALIFORNIA

Approved By:

DATE JULY 2000

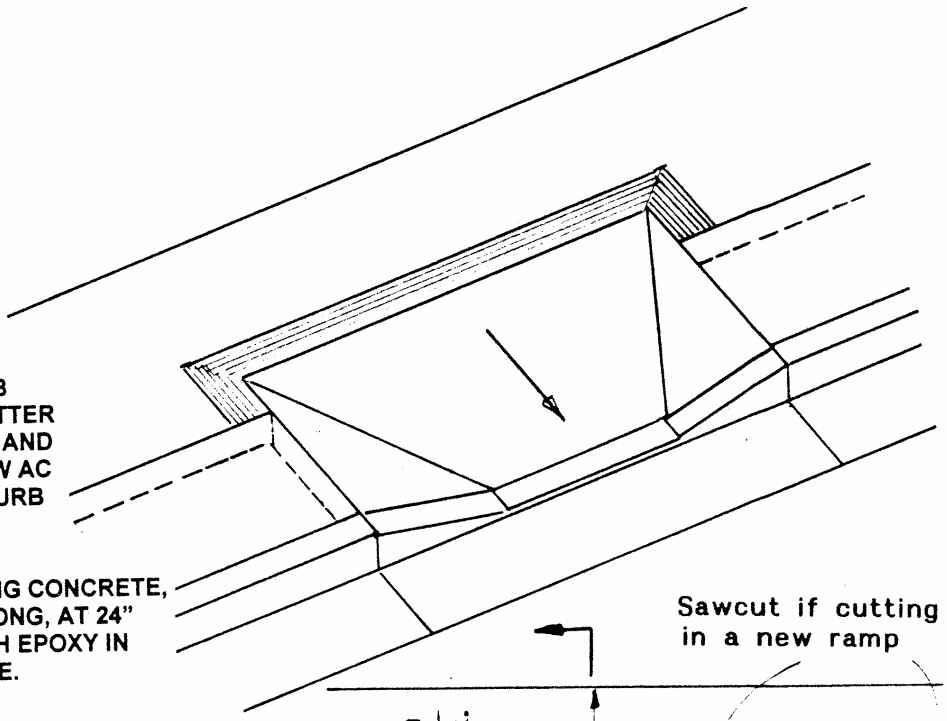
REV. DATE

13C-3

2000 STANDARD DETAILS

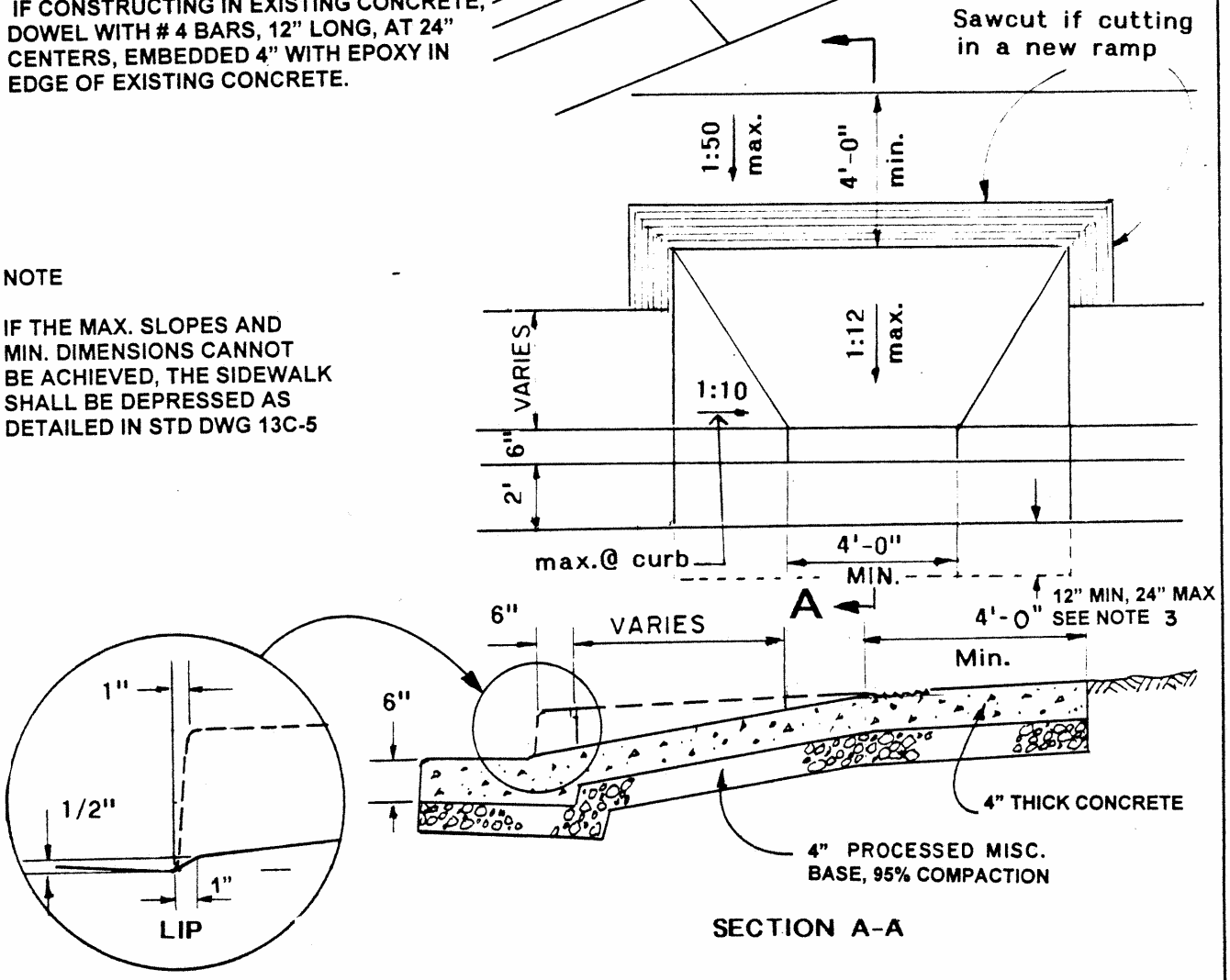
NOTES:

1. THE SURFACE SHALL BE ROUGH BROOM FINISH.
2. FOR GROOVE DETAILS, SEE STD DRAWING 13C-1.
3. IF CONSTRUCTING NEW CURB RAMP IN EXISTING CURB, GUTTER AND SIDEWALK, SAWCUT AC AND REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF CURB RAMP.
4. IF CONSTRUCTING IN EXISTING CONCRETE, DOWEL WITH # 4 BARS, 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.



NOTE

IF THE MAX. SLOPES AND MIN. DIMENSIONS CANNOT BE ACHIEVED, THE SIDEWALK SHALL BE DEPRESSED AS DETAILED IN STD DWG 13C-5



SECTION A-A

PERPENDICULAR CURB RAMP

NON MONOLITHIC SIDEWALK

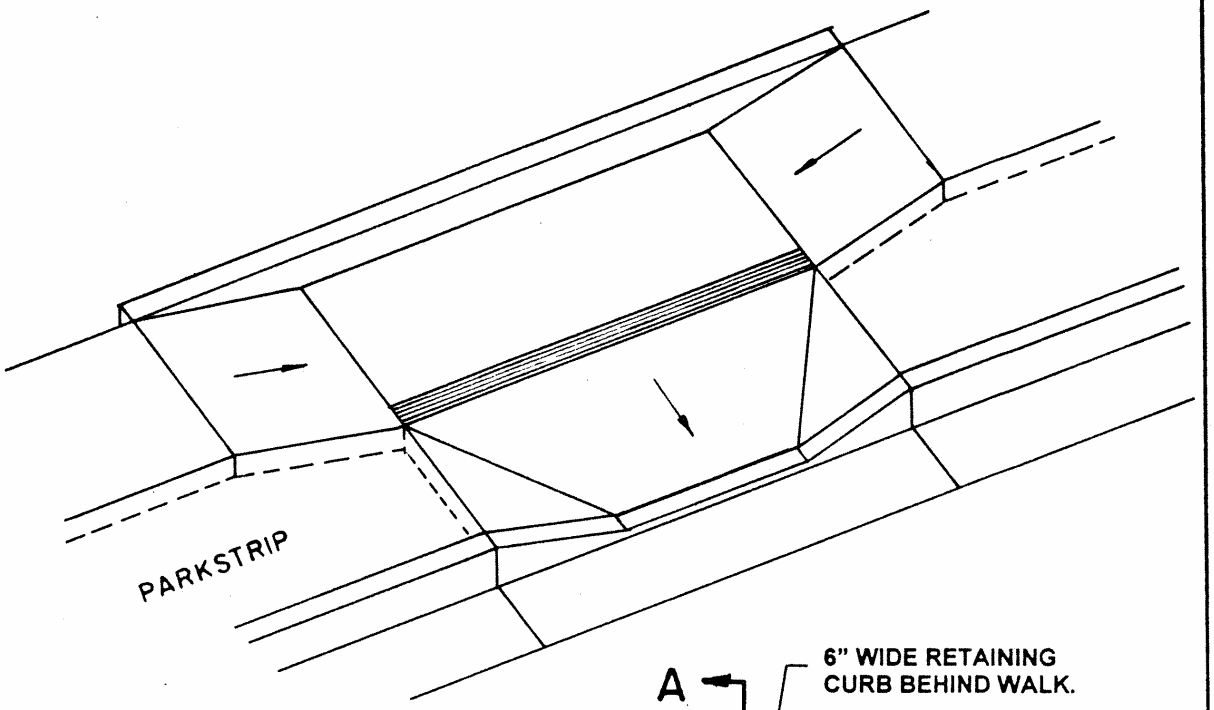
Approved By: Mayor A. Rae

DATE JULY 1998

REV. DATE JULY 2000

13C-4

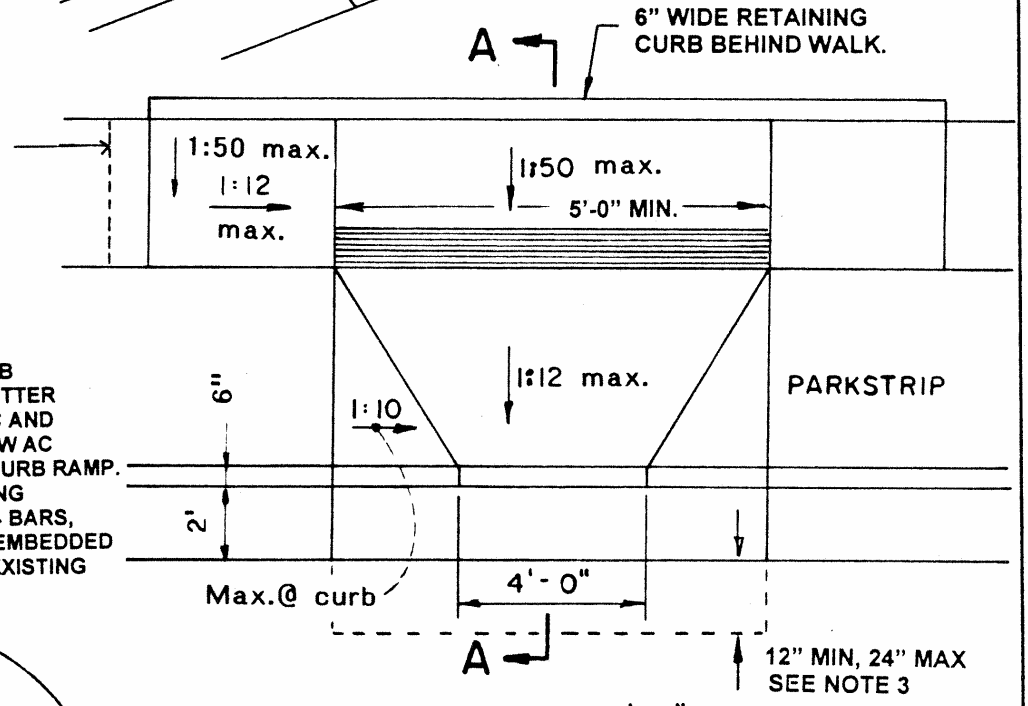
1997 STANDARD DETAILS

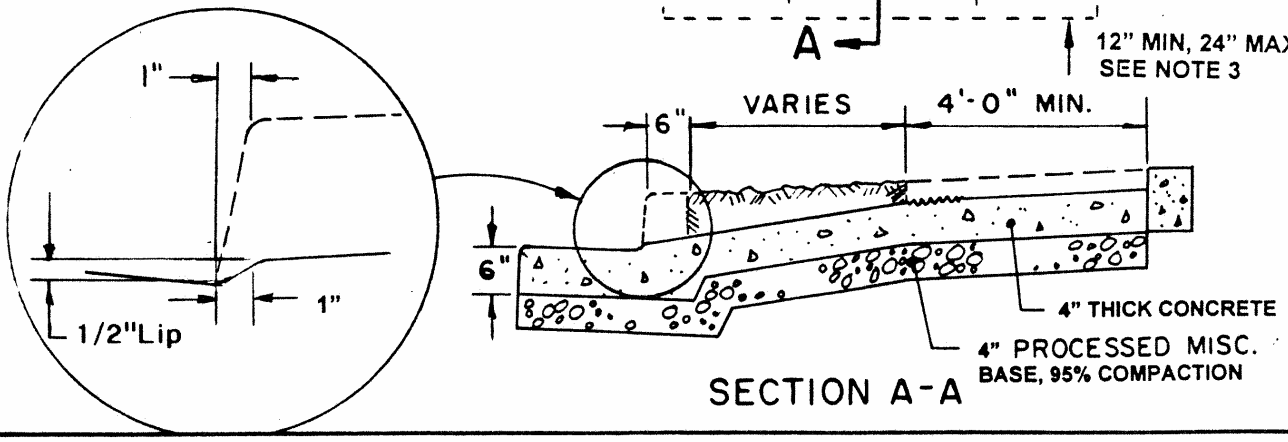


SAWCUT TO EXISTING JOINT OR SCORE MARK IF CUTTING IN A NEW CURB RAMP

NOTES:

1. THE SURFACE SHALL BE ROUGH BROOM FINISH.
2. FOR GROOVE DETAILS, SEE STD DRAWING 13C-1.
3. IF CONSTRUCTING NEW CURB RAMP IN EXISTING CURB, GUTTER AND SIDEWALK, SAWCUT AC AND REMOVE. REPLACE WITH NEW AC AFTER CONSTRUCTION OF CURB RAMP.
4. IF CONSTRUCTING IN EXISTING CONCRETE, DOWEL WITH # 4 BARS, 12" LONG, AT 24" CENTERS, EMBEDDED 4" WITH EPOXY IN EDGE OF EXISTING CONCRETE.





SECTION A-A

COMBINED PARALLEL/PERPENDICULAR CURB RAMPS

NON-MONOLITHIC SIDEWALK

CITY OF SUNNYVALE CALIFORNIA

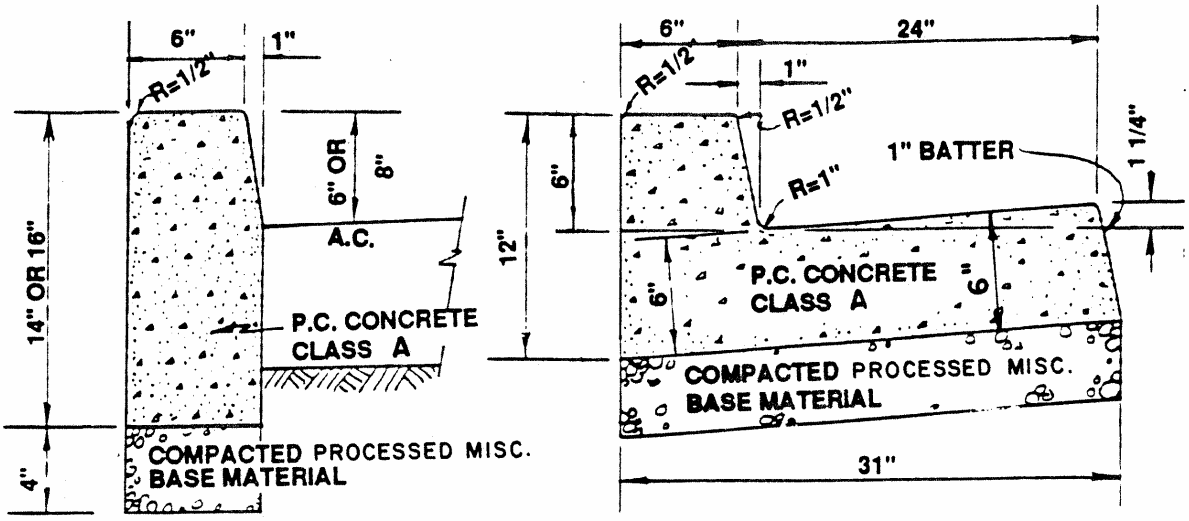
Maura A. Rose
APPROVED BY:

DATE: Aug. 1997
REV DATE: JULY 2000

13C-5

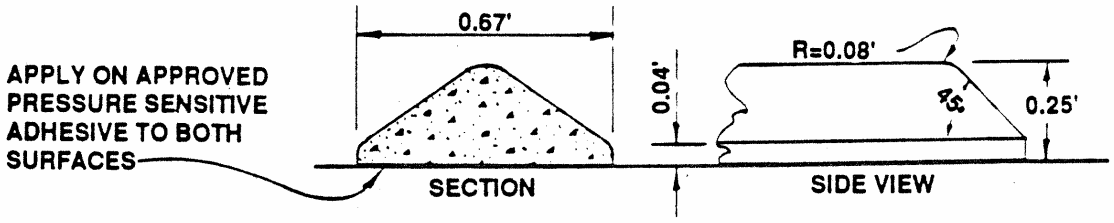
2000 STANDARD DETAILS

A 3" HIGH LETTER "S" OR "W" IS TO BE PLACED ON TOP OF CURB AT PROPER LOCATIONS OVER LATERALS.

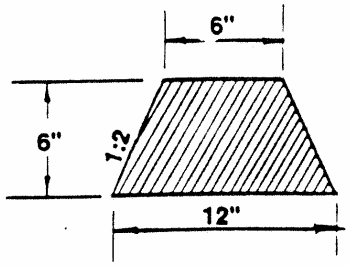


TYPE I-6 AND I-8 CURB

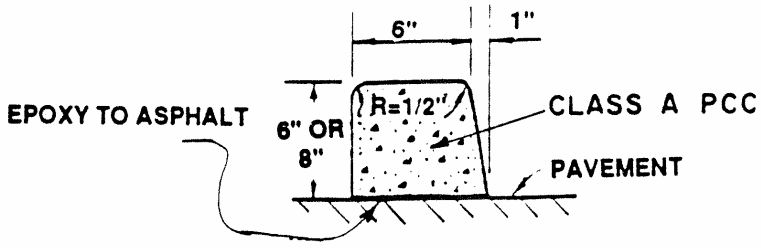
TYPE II CURB



STD. RAISED TRAFFIC BARS



A.C. DIKE



TYPE III-6 AND III-8 CURB

CURBS: TYPES I-6, I-8, II, III-6 , III-8 AC DIKE, AND TRAFFIC BARS

CITY OF SUNNYVALE CALIFORNIA

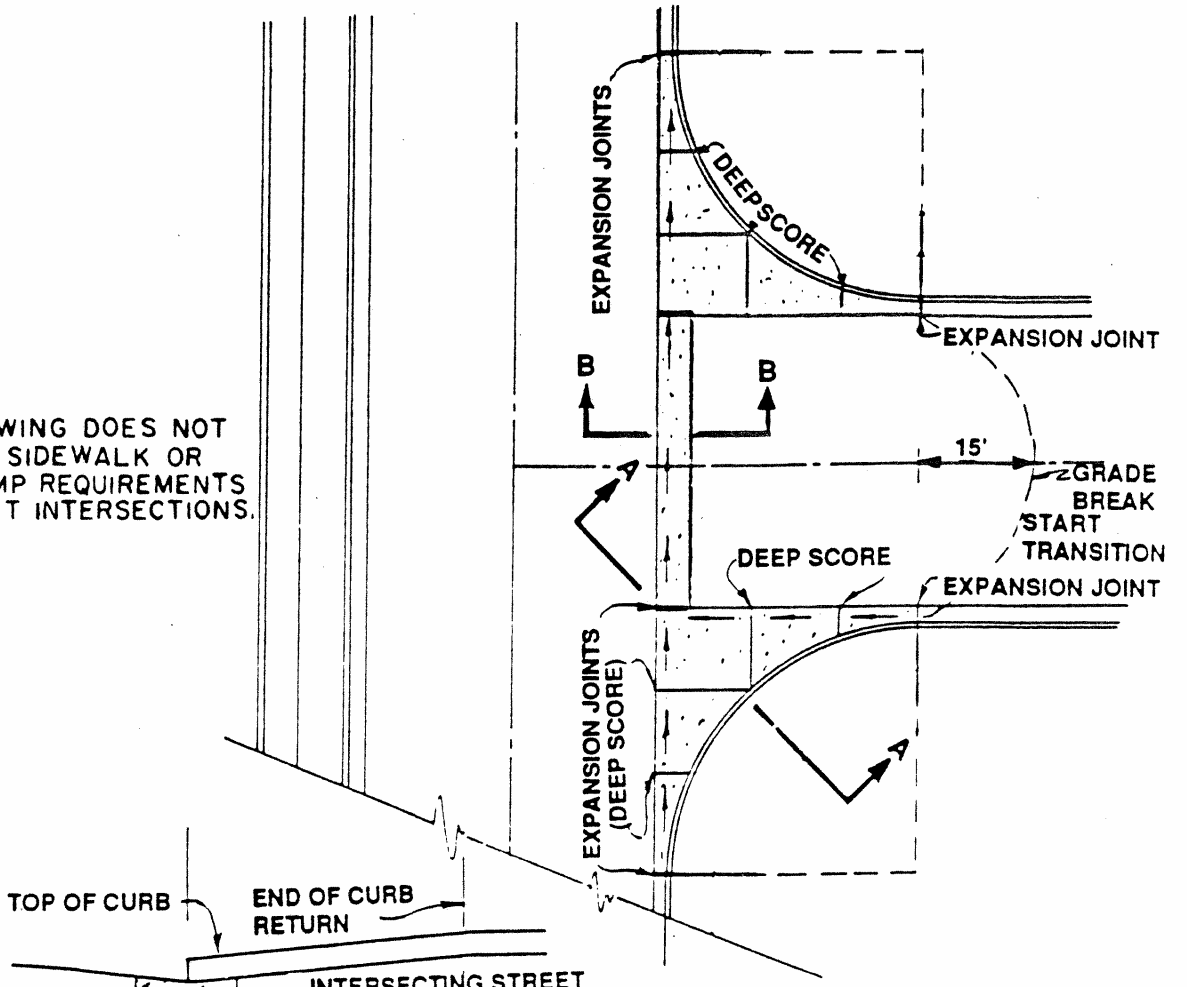
Marvin A. Rose
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

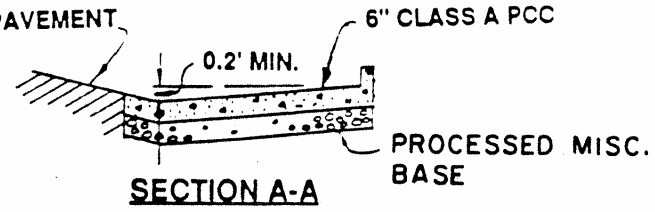
DRWG. 15C

2000 STANDARD DETAILS

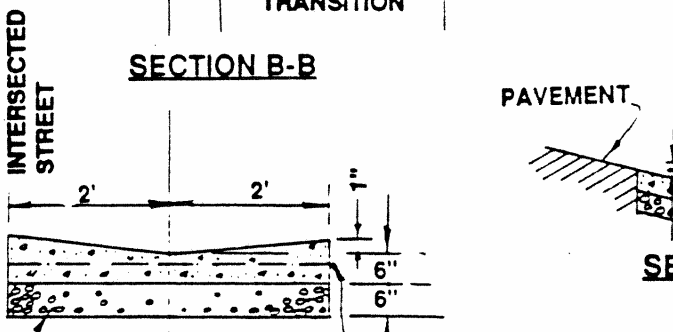
NOTE:
THIS DRAWING DOES NOT ADDRESS SIDEWALK OR CURB RAMP REQUIREMENTS AT STREET INTERSECTIONS.



SECTION B-B



SECTION A-A



TYPICAL SECTION

VALLEY GUTTER AT STREET INTERSECTION

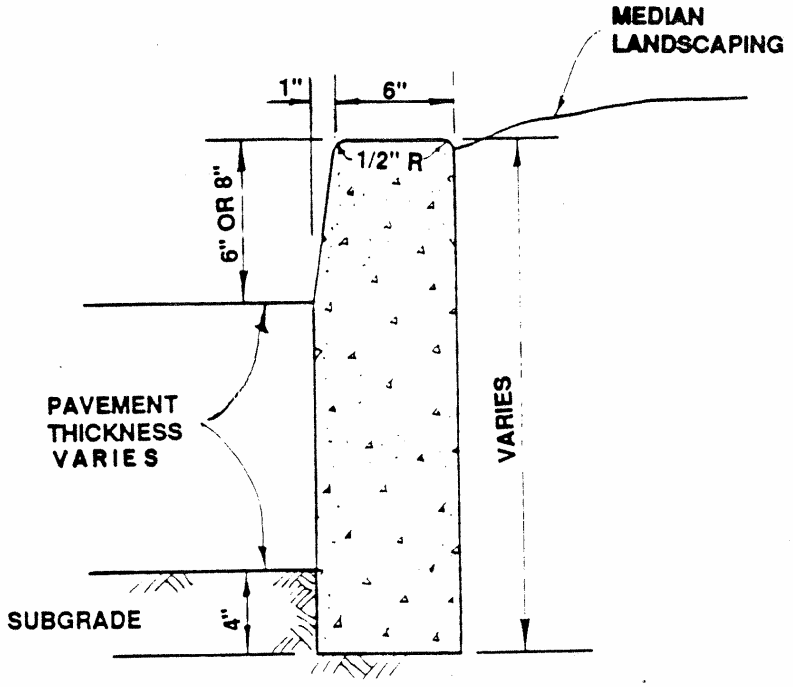
APPROVED BY:

DATE JUNE 30, 1991

REV. DATE JULY 2000

DRWG. 16C

2000 STANDARD DETAILS



TYPE IV-6 & IV-8 DEEP VERT. CURB

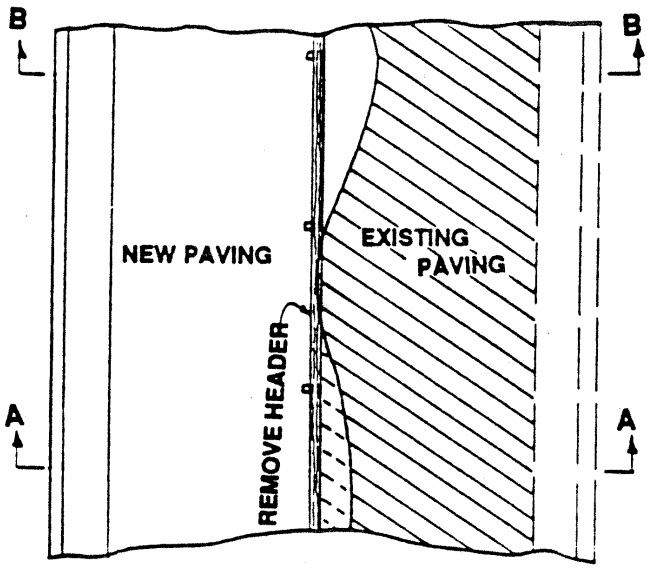
APPROVED BY:

DATE: JUNE 30, 1991

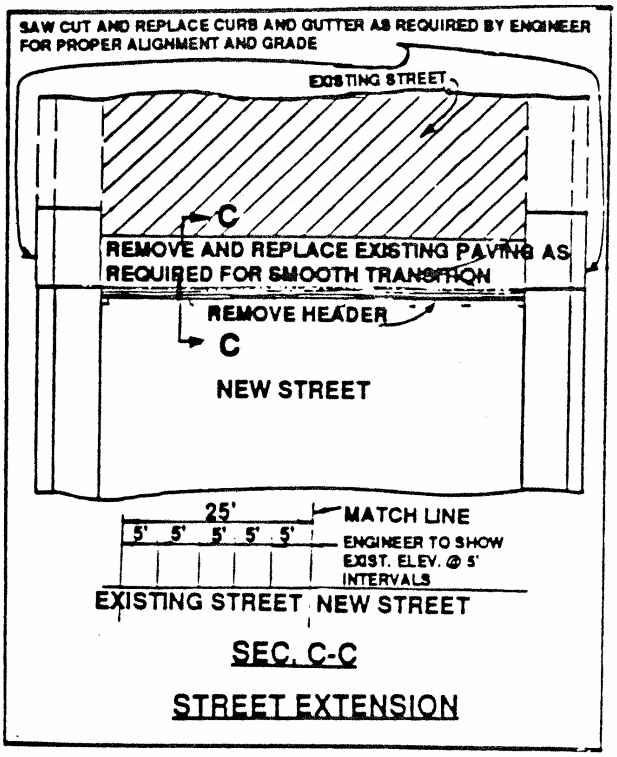
REV. DATE: JULY 1998

DRWG. 17C

2000 STANDARD DETAILS

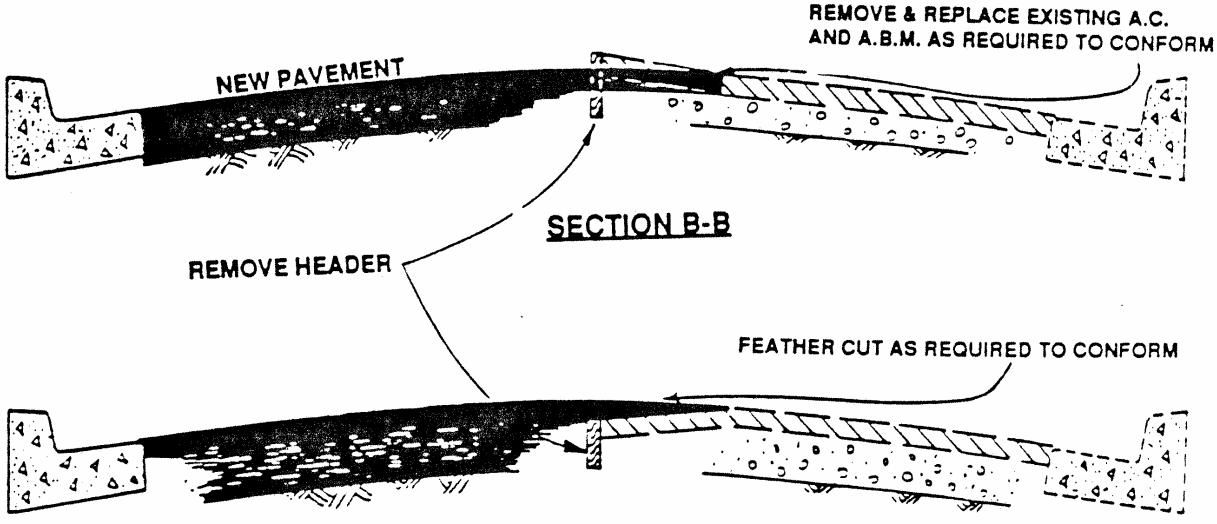


HALF STREET IMPROVEMENT



SEC. C-C

STREET EXTENSION



SECTION B-B

SECTION "A-A"

NO SCALE

PAVEMENT CONNECTIONS

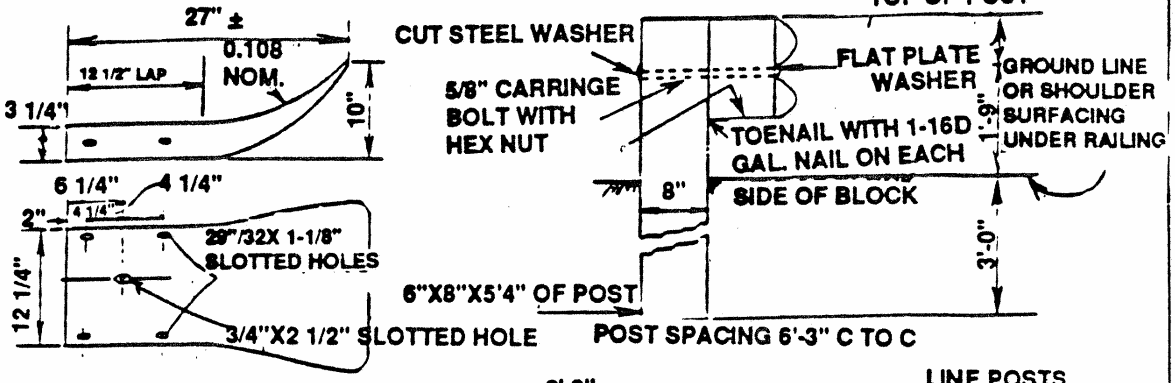
APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 2000

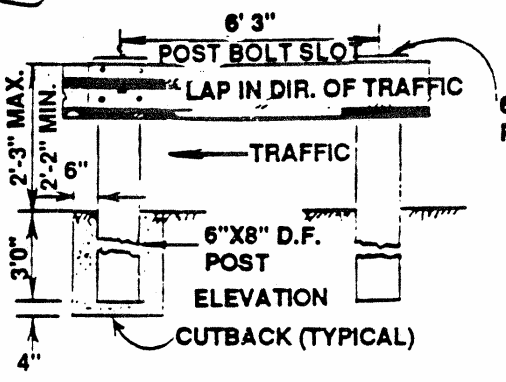
DRWG. 19C

2000 STANDARD DETAILS

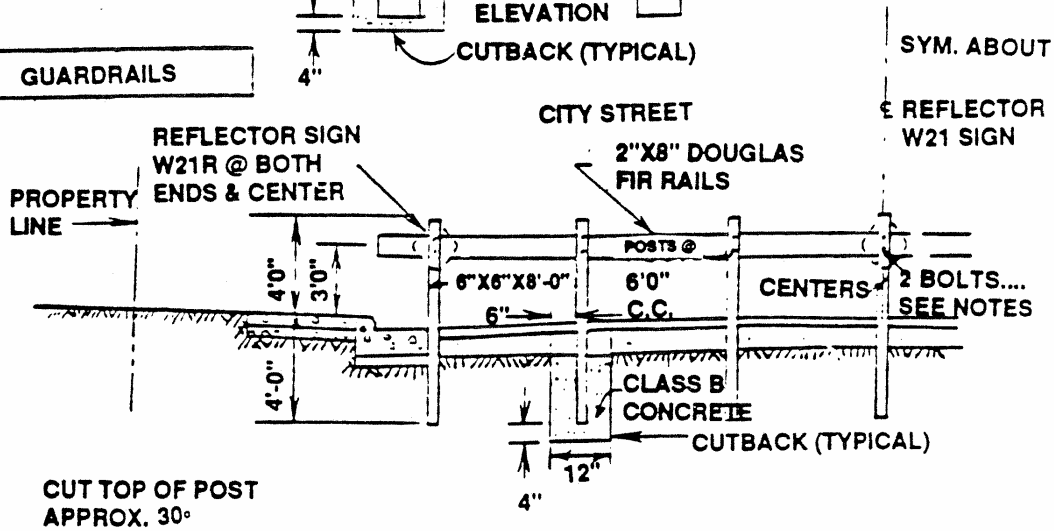


LINE POSTS

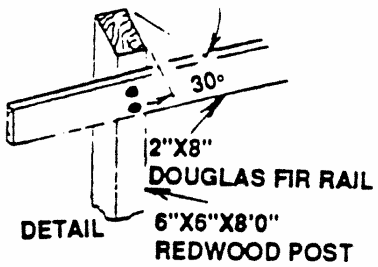
TERMINAL SECTION



GUARDRAILS



CUT TOP OF POST
APPROX. 30°



BARRICADES

NOTES

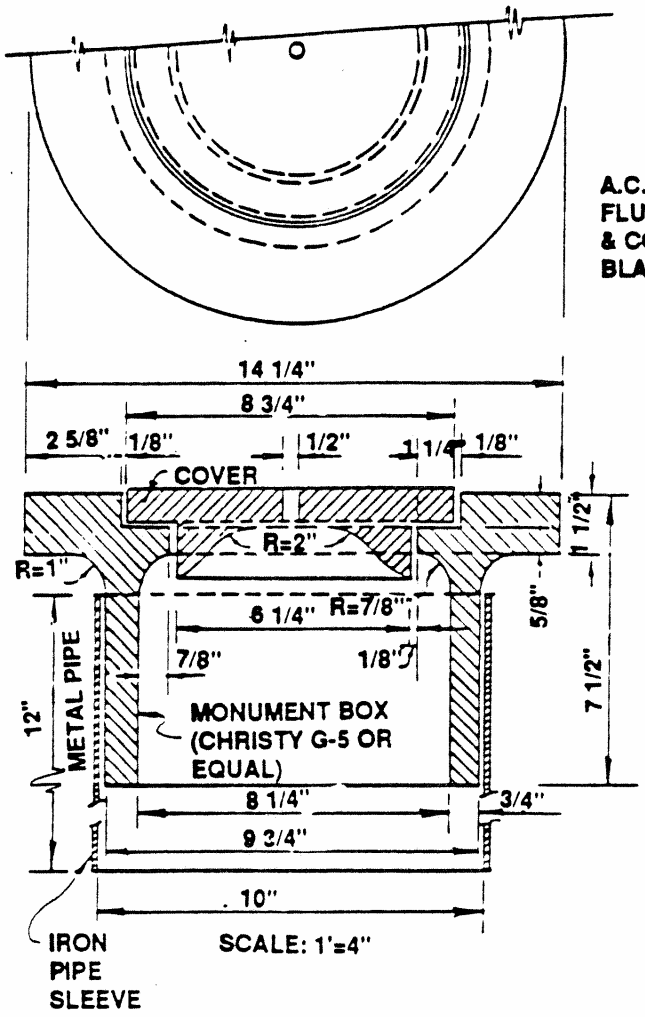
1. RAILS SHALL BE FASTENED TO THE POSTS WITH 5/8" GALV. MACHINE BOLTS AND CAST IRON WASHERS.
2. POSTS SHALL BE CUT PER "DETAIL".
3. BARRICADES SHALL BE PRINTED WITH TWO COATS OF STANDARD OUTSIDE WHITE PAINT.
4. PLACE REFLECTOR SIGN AS SHOWN.
5. BARRICADES TO BE EXTENDED OVER SIDEWALK AS REQUIRED BY THE ENGINEER.

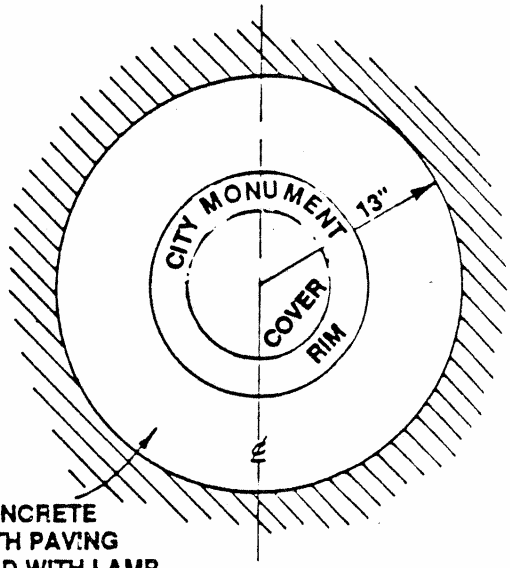
GUARDRAILS & BARRICADES

APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 1998

DRWG. 20C





MONUMENT
INSTALLATION DETAIL

STREET MONUMENT AND MONUMENT BOX

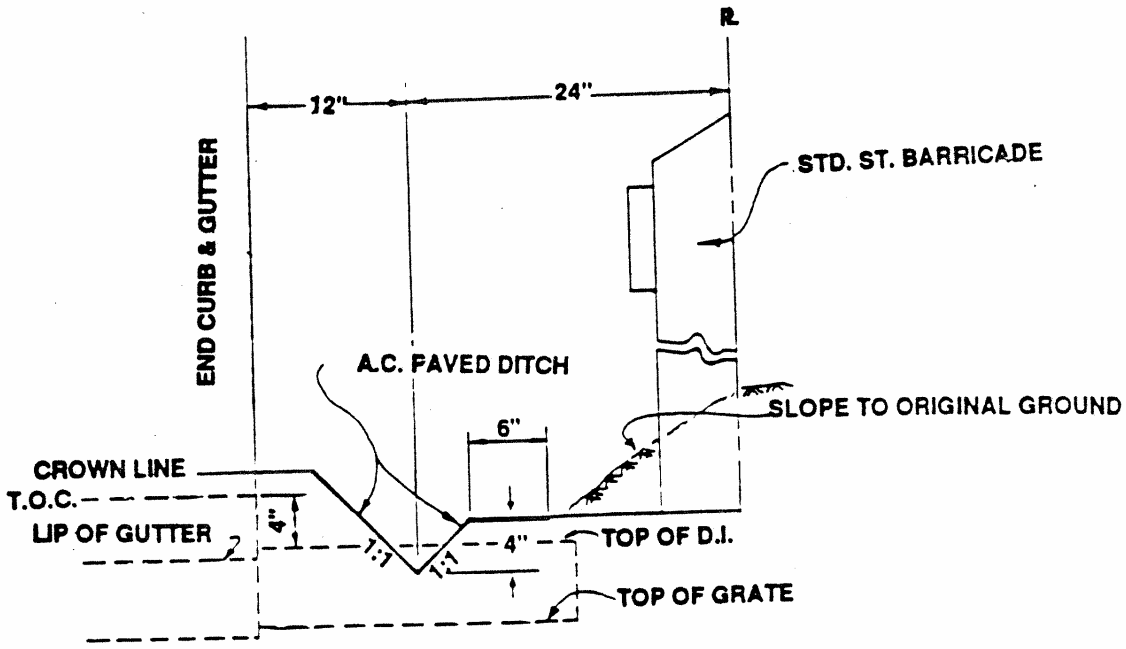
APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 1998

DRWG. 21C

2000 STANDARD DETAILS



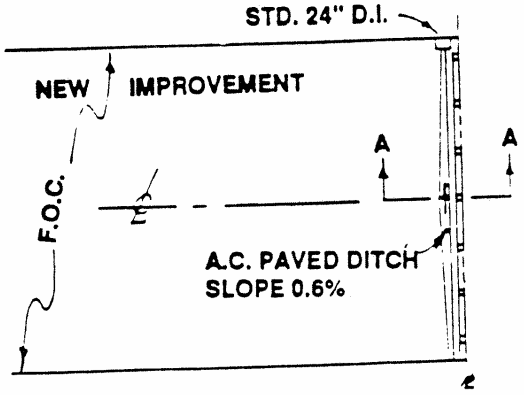
SECTION A-A

NO SCALE

NOTES

END CURB & GUTTER 3' FROM PROPERTY LINE.

TOP OF D.I. TO BE 4" BELOW TOP OF CURB GRADE.



TEMPORARY DEAD END STREET

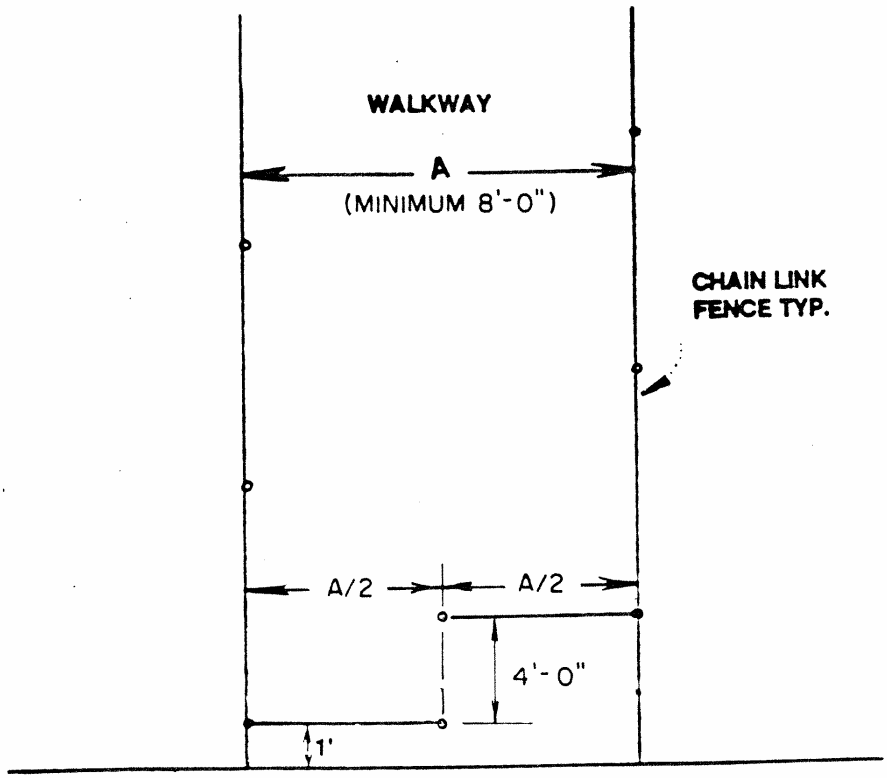
APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 1998

DRWG. 22C

2000 STANDARD DETAILS



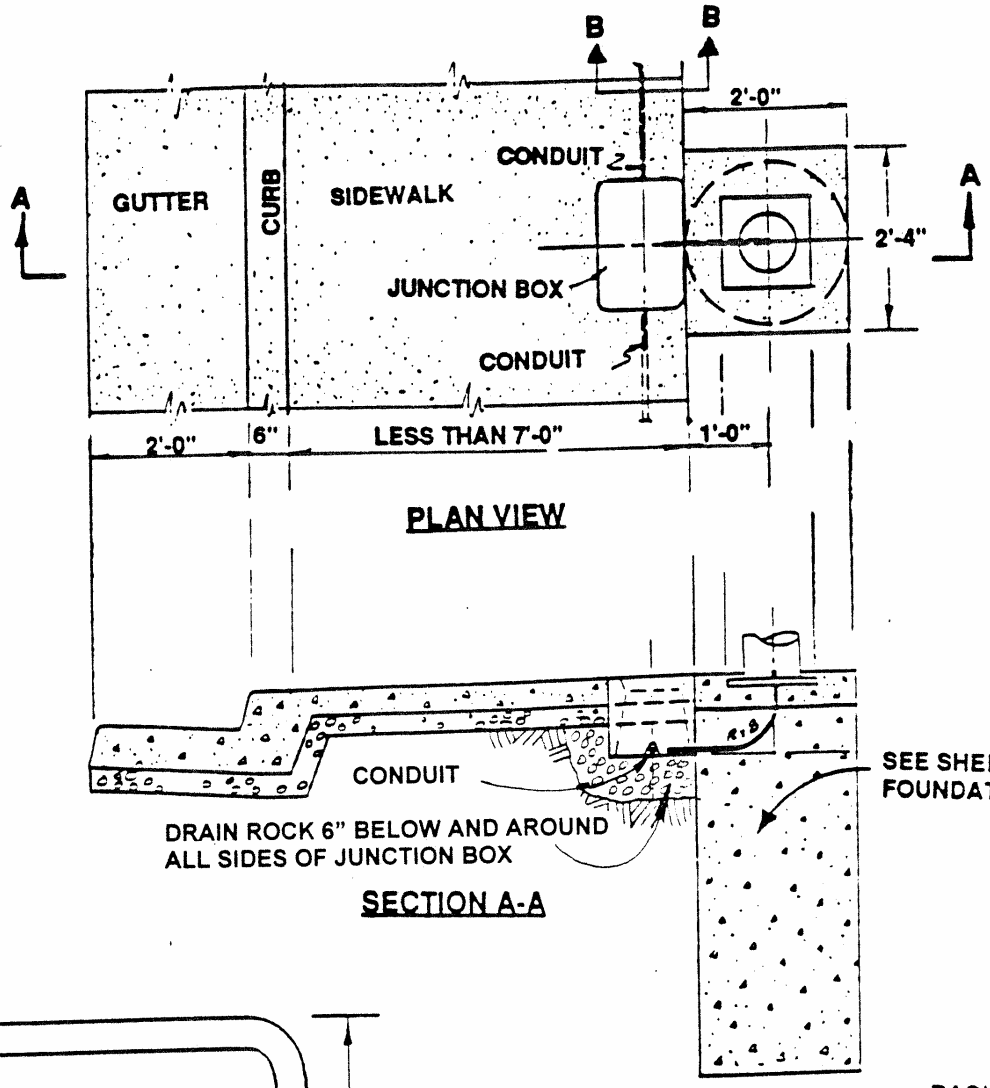
WALKWAY MAZES

APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

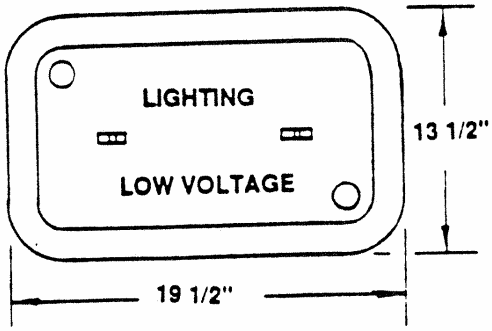
DRWG. 23C

2000 STANDARD DETAILS

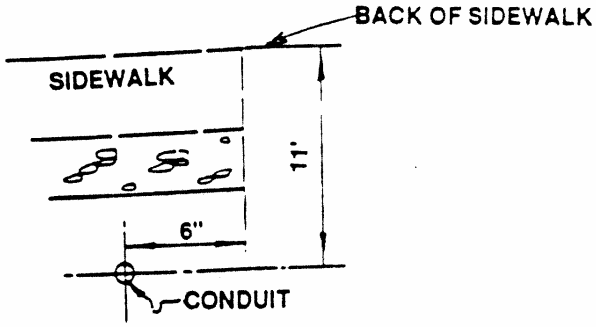


PLAN VIEW

SECTION A-A



JUNCTION BOX
STATE OF CALIF. STD. #3 1/2



SECTION B-B

NOTES:

1. FOR LOCATIONS WITH WIDER MONOLITHIC SIDEWALKS AND NON-MONOLITHIC SIDEWALKS, SEE STANDARD DETAIL 2D.
2. IF THERE IS NO SIDEWALK, LOCATE IN ACCORDANCE WITH THIS STANDARD DETAIL WITH THE FOUNDATION CENTERED 6'-6" FROM FACE OF CURB.

ELECTROLIER AND CONDUIT INSTALLATION — SHEET 1 OF 2

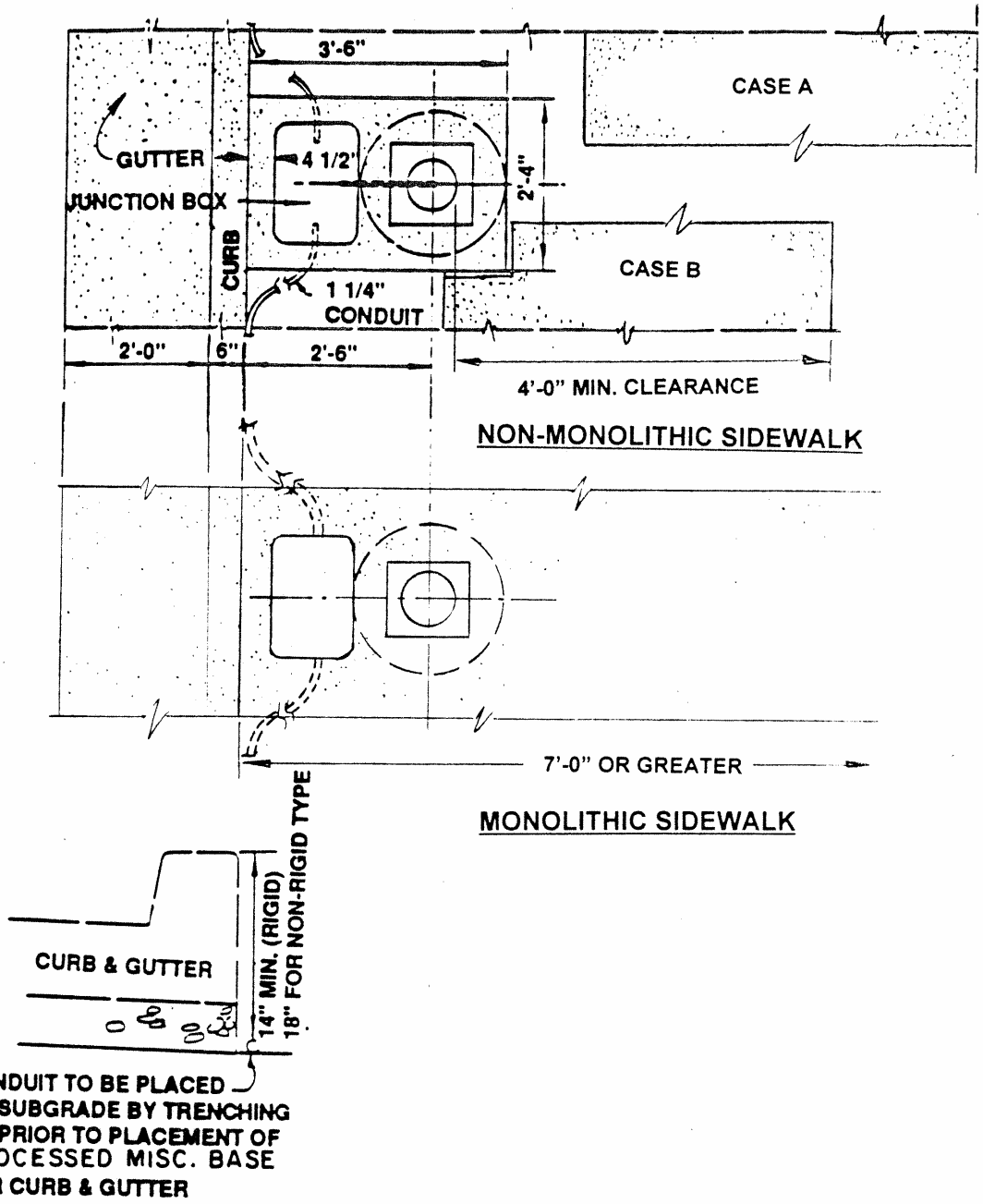
APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 1998

DWG. 1D

2000 STANDARD DETAILS



NOTES:

1. FOR NON-MONOLITHIC SIDEWALK.
   CASE A: APPLIES IF FRONT OF SIDEWALK IS AT LEAST 4'-0" FROM FACE OF CURB.
   CASE B: APPLIES IF FRONT OF SIDEWALK IS LESS THAN 4'-0" FROM FACE OF CURB, AND THERE IS A MINIMUM OF 4'-0" CLEAR SIDEWALK BETWEEN POLE AND BACK OF SIDEWALK. IF THIS 4'-0" MINIMUM CLEAR SIDEWALK CANNOT BE ACHIEVED, STANDARD DETAIL 1D SHALL BE USED (i.e. INSTALL ELECTROLIER BEHIND THE SIDEWALK).
2. FOR MONOLITHIC SIDEWALKS LESS THAN 7'-0" WIDE USE STANDARD DETAIL 1D.
3. DRAIN ROCK AROUND JUNCTION BOX AS SHOWN IN STD. DETAIL 1D.

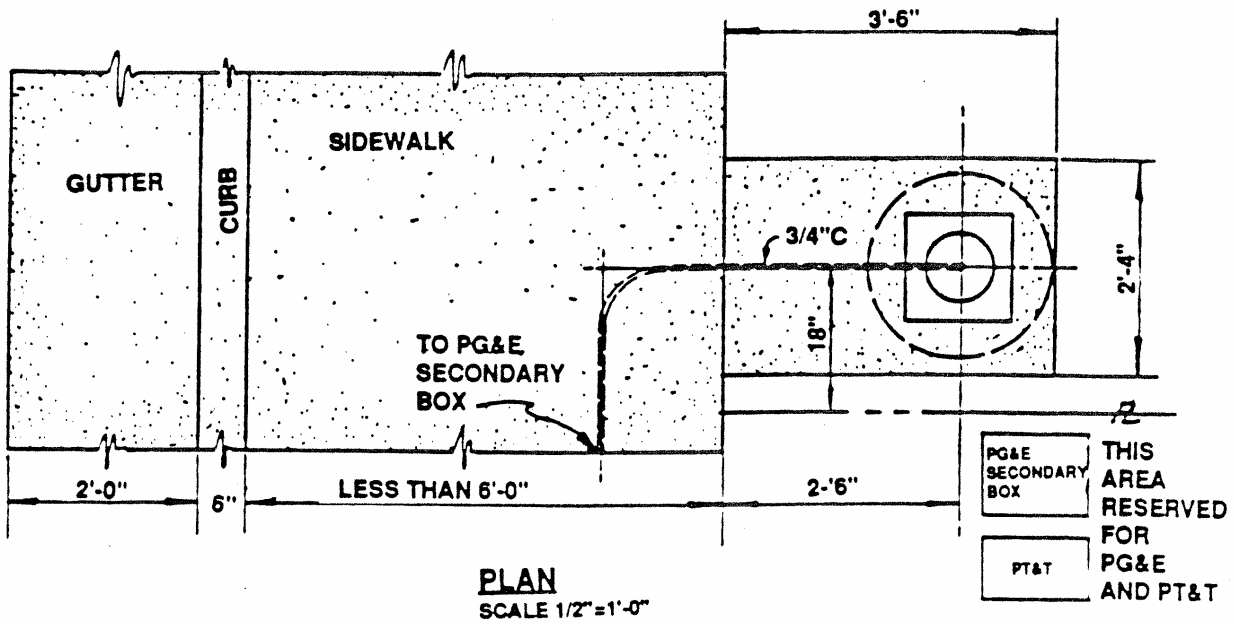
ELECTROLIER AND CONDUIT INSTALLATION — SHEET 2 OF 2

APPROVED BY:

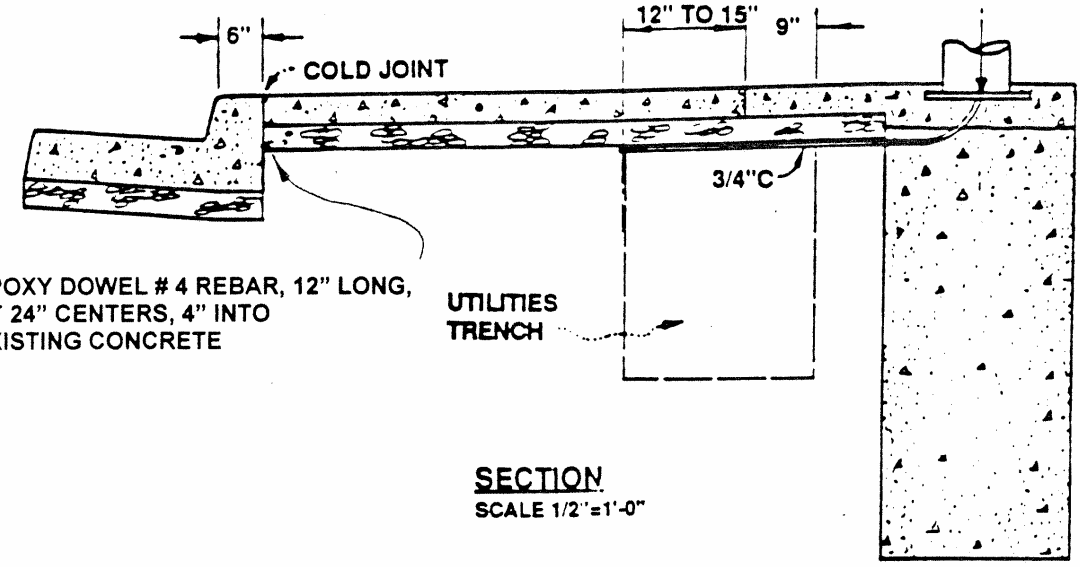
DATE: JUNE 30, 1991
REV. DATE: JULY 2000

2 D

2000 STANDARD DETAILS



PLAN
SCALE 1/2"=1'-0"



SECTION
SCALE 1/2"=1'-0"

ELECTROLIER AND CONDUIT LOCATION

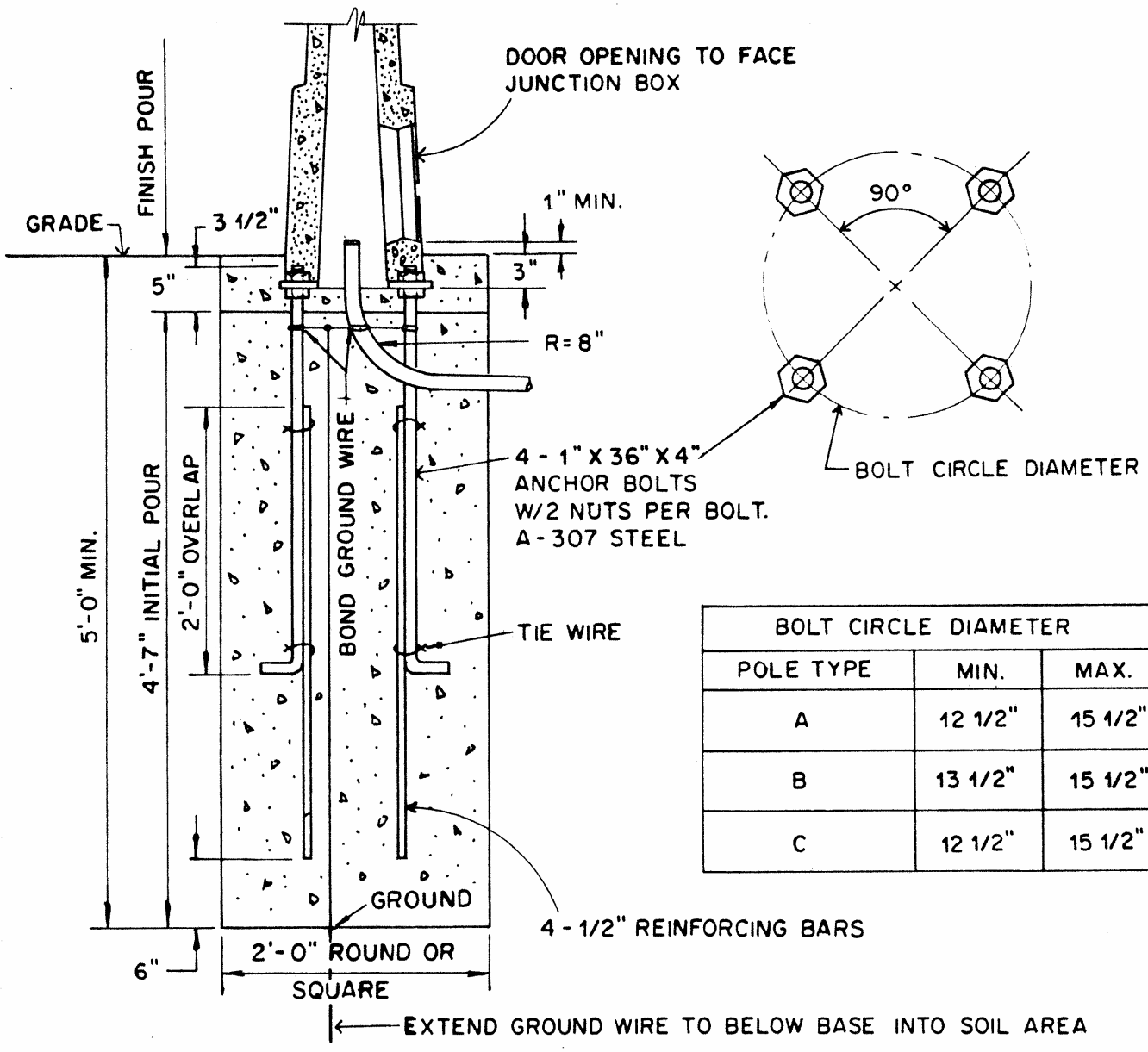
(SUBDIVISIONS SERVED BY UNDERGROUND PG&E POWER DISTRIBUTION SYSTEM)

APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 1998

3 D

2000 STANDARD DETAILS



BOLT CIRCLE DIAMETER		
POLE TYPE	MIN.	MAX.
A	12 1/2"	15 1/2"
B	13 1/2"	15 1/2"
C	12 1/2"	15 1/2"

NOTES:

1. FINISH POUR SHALL BE MADE ONLY AFTER ELECTROLIER STANDARD HAS BEEN RAISED AND PLUMBED, LUMINAIRES LEVELED AND ALL WORK INSPECTED.
2. PCC FINISH SHALL BE TO GRADE AND NOT CREATE TRIPPING HAZARD (IN SIDEWALK AND SOIL INSTALLATIONS).

ELECTROLIER FOUNDATION

CITY OF SUNNYVALE CALIFORNIA

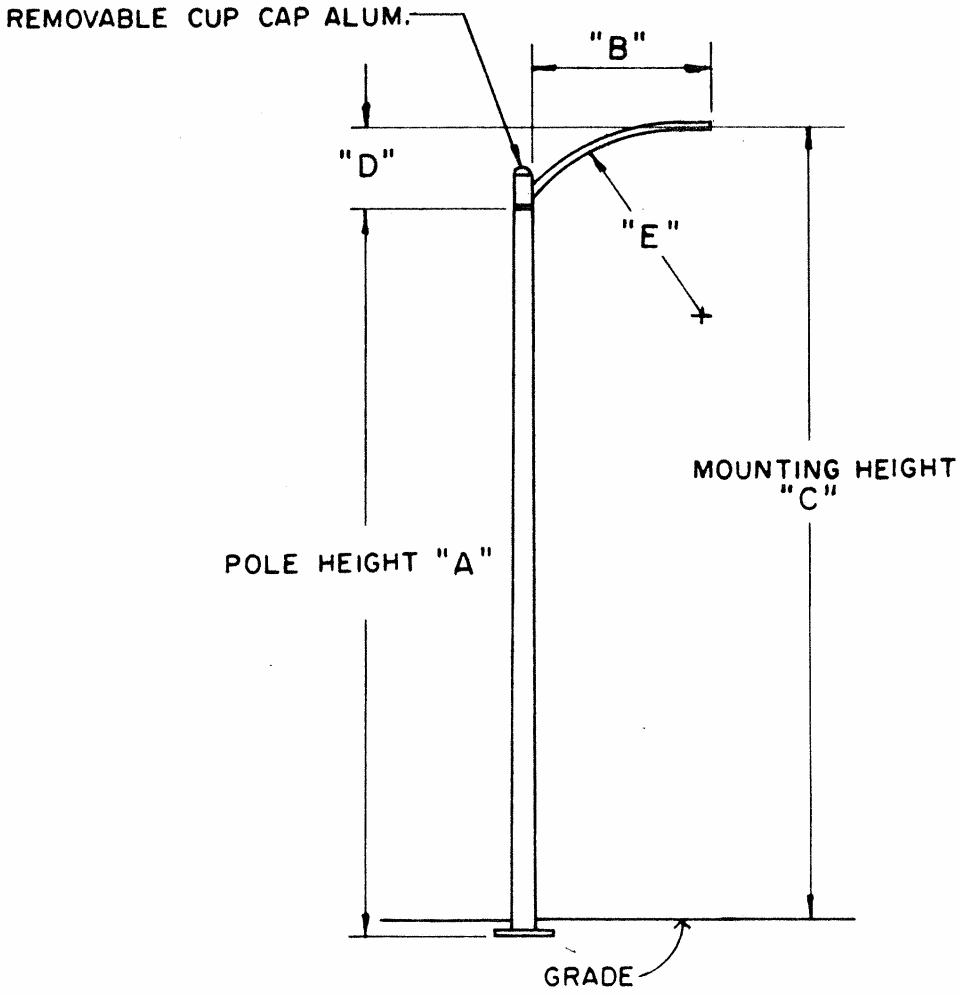
APPROVED

DATE JUNE 23, 2000

REV. DATE

DRWG. 4D-1

2000 STANDARD DETAILS



POLE TYPE		"A"	"B"	"C"	"D"	"E"
A WITH	4' ARM	25'-1"	4'-0"	26'-9"	1'-11"	4'-8 1/2"
	6' ARM	25'-1"	6'-0"	27'-6"	2'-8"	7'-6 1/4"
	8' ARM	25'-1"	8'-0"	28'-4"	3'-6"	10'-6"
B WITH	4' ARM	26'-7"	4'-0"	28'-3"	1'-11"	4'-8 1/2"
	6' ARM	26'-7"	6'-0"	29'-0"	2'-8"	7'-6 1/4"
	8' ARM	26'-7"	8'-0"	29'-10"	3'-6"	10'-6"
C WITH	4' ARM	30'-0"	4'-0"	31'-9"	2'-0"	4'-8 1/2"
	6' ARM	30'-0"	6'-0"	32'-5"	2'-8"	7'-6 1/4"
	8' ARM	30'-0"	8'-0"	33'-3"	3'-6"	10'-6"

ELECTROLIER POLES

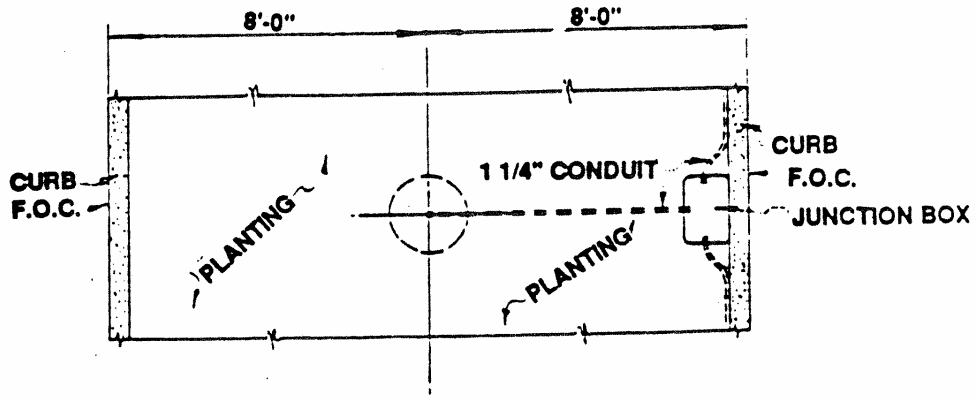
CITY OF SUNNYVALE CALIFORNIA

APPROVED

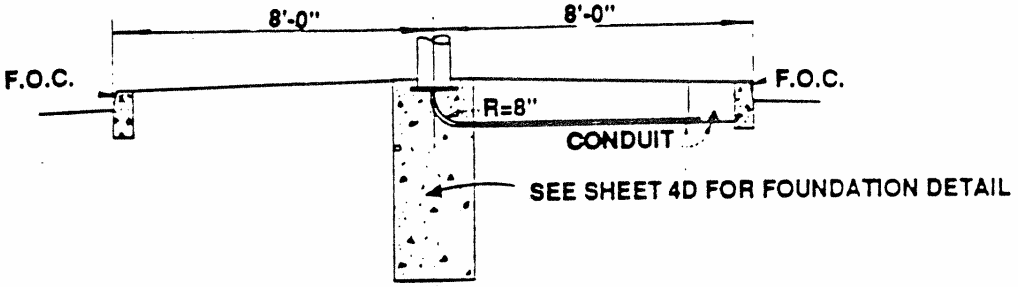
DATE JUNE, 30, 2000

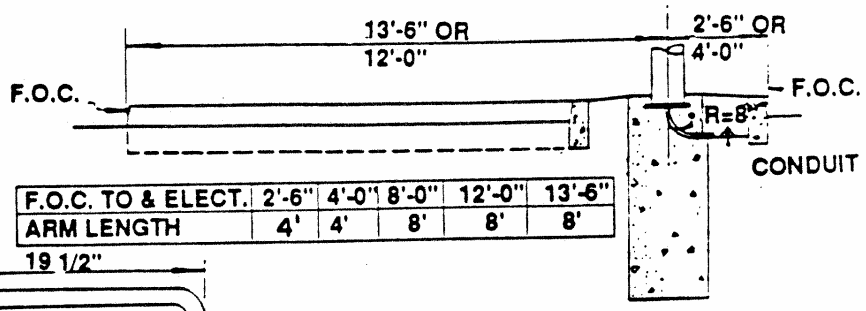
REV. DATE

DRWG. 4D-2

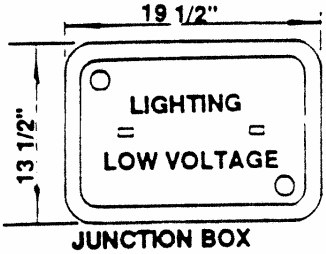


PLAN VIEW





F.O.C. TO & ELECT.	2'-6"	4'-0"	8'-0"	12'-0"	13'-6"
ARM LENGTH	4'	4'	8'	8'	8'

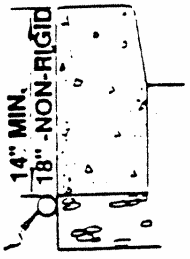


JUNCTION BOX
STATE OF CALIF. STD. #3 1/2

NO SCALE

SECTION

CONDUIT TO BE PLACED ON SUBGRADE BY TRENCHING OR PRIOR TO PLACEMENT OF AGGREGATE BASE MATERIAL FOR CURB & GUTTER



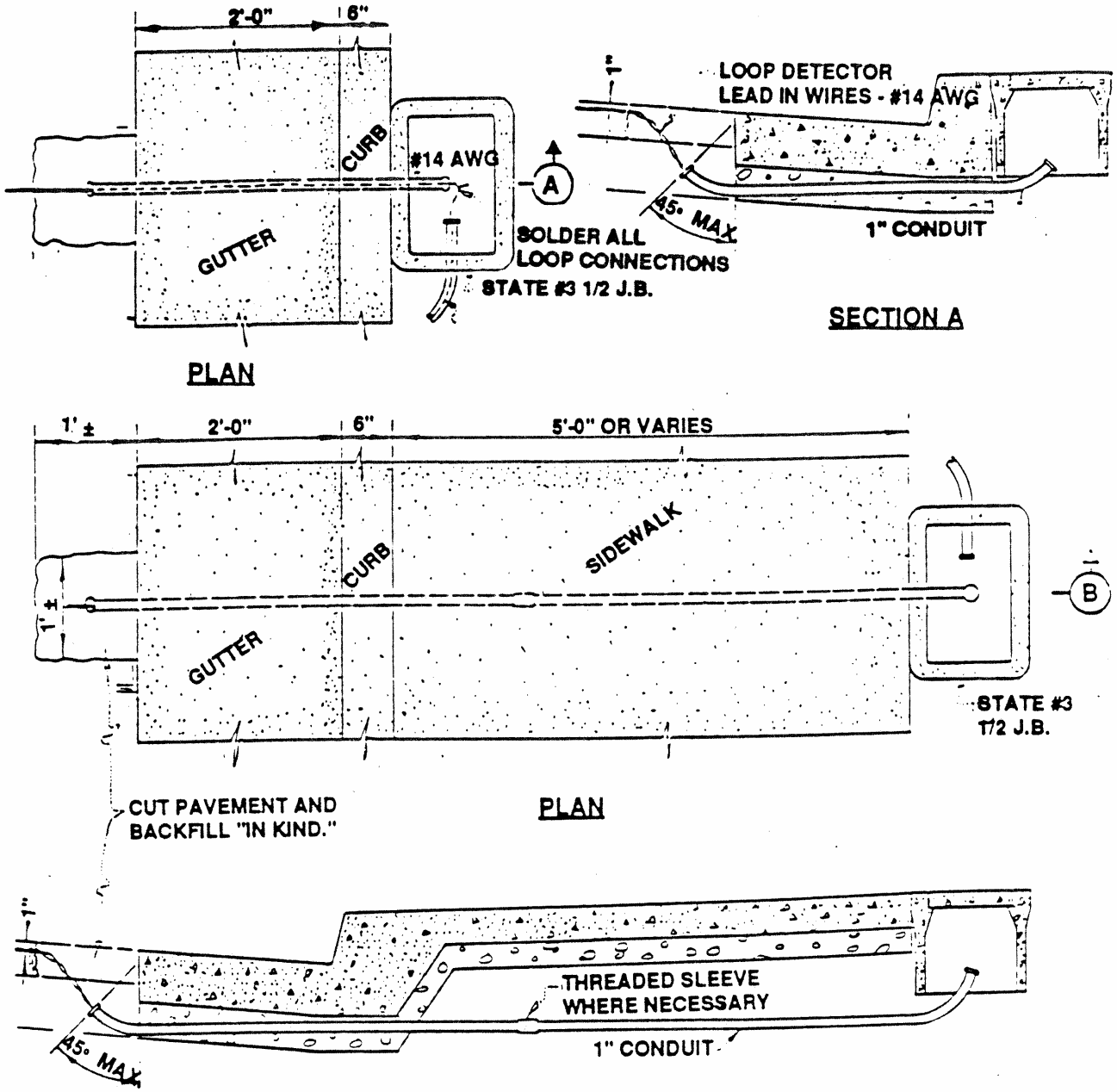
ELECTROLIER AND CONDUIT LOCATION IN MEDIAN ISLANDS

APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

DWG. 5D

2000 STANDARD DETAILS



CONDUIT DETAIL

LOOP DETECTOR LEAD IN WIRES

APPROVED BY:

DATE: JUNE 30, 1991

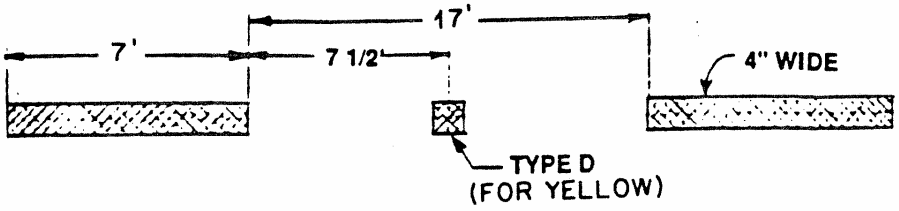
REV. DATE: JULY 1998

DRWG. 6D

2000 STANDARD DETAILS

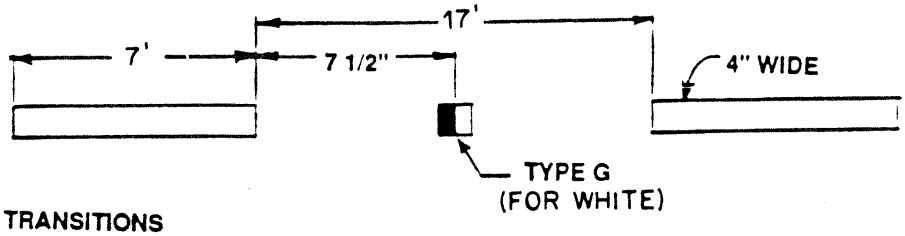
LINE DELINEATORS

DETAIL 1



YELLOW STITCH LINE
(CENTERLINE - 2 LANE HIGHWAY

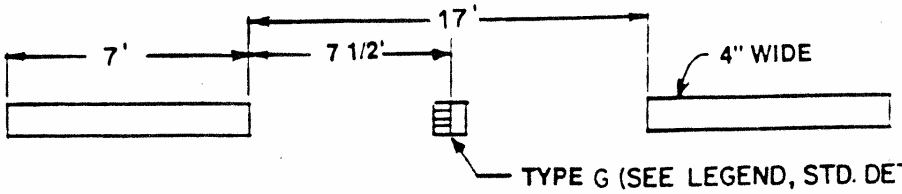
DETAIL 2



TYPE G IN TRANSITIONS

WHITE STITCH LINE (NO MEDIAN)
(LANE LINE - MULTILANE HIGHWAY)

DETAIL 3



TYPE C IN TRANSITIONS

WHITE STITCH LINE (WITH MEDIANS)
(LANE LINE - MULTILANE HIGHWAY)

WHITE AND YELLOW STITCH LINES

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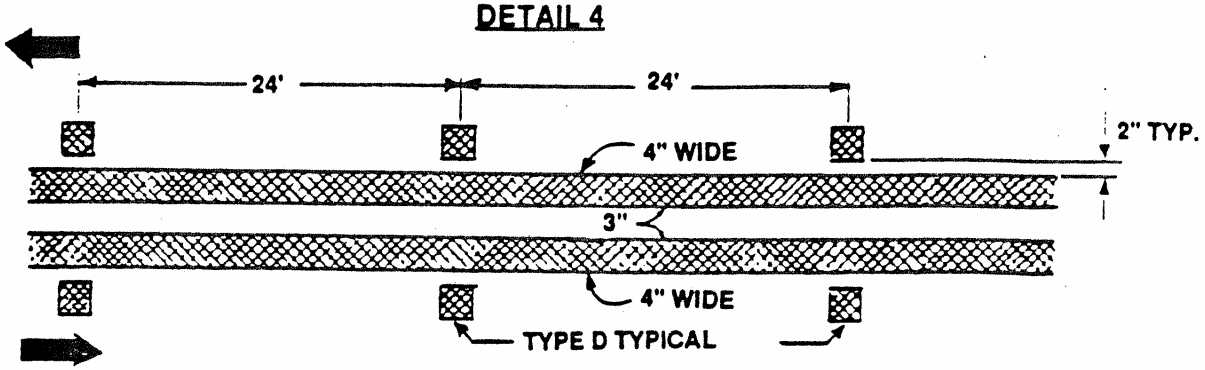
REV. DATE: JULY 2000

DRWG. 2E

2000 STANDARD DETAILS

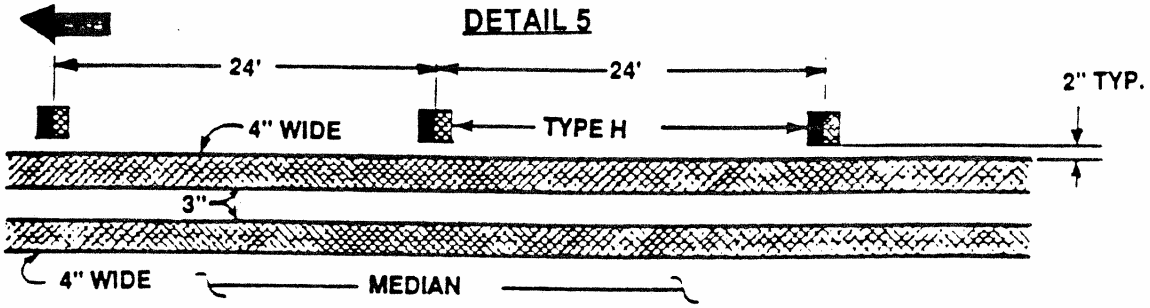
DETAIL 4



DOUBLE YELLOW LINE (NO MEDIAN)

NO PASSING ZONES - TWO DIRECTION

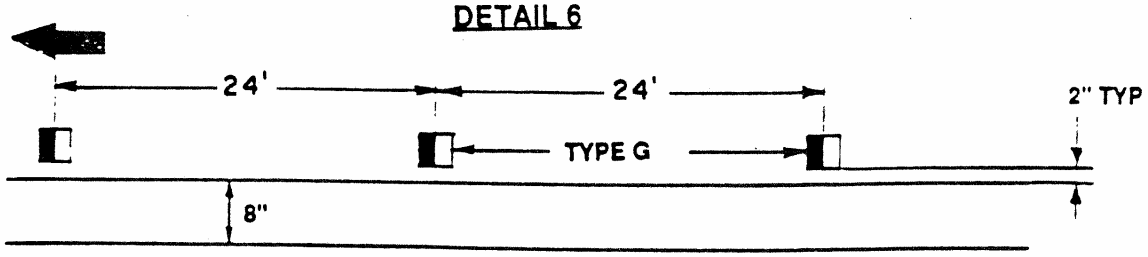
DETAIL 5



DOUBLE YELLOW LINE (WITH MEDIAN)

NO PASSING ZONES - TWO DIRECTION

DETAIL 6



8" WHITE CHANNELIZATION STRIPE

2000 STANDARD DETAILS

8" WHITE CHANNELIZATION STRIPE, DOUBLE YELLOW

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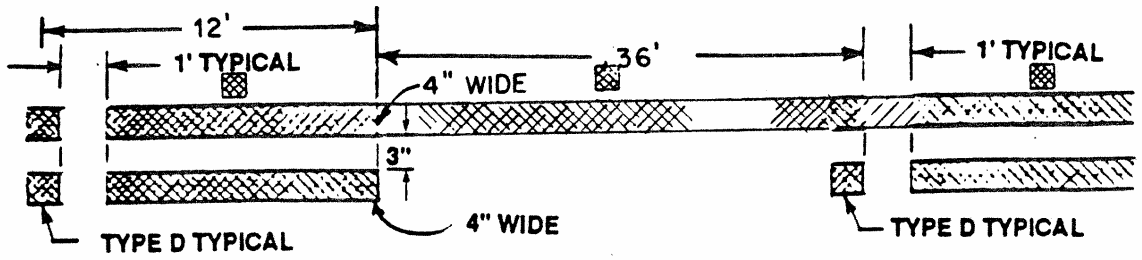
REV. DATE: JULY 2000

DRWG. 3E

DETAIL 7



TWO-WAY LEFT-TURN LANES

(SEE DETAIL 6-32 OF CALTRANS TRAFFIC MANUAL)

LEGEND:

MARKERS

TYPE AY	4" PLAIN YELLOW NON-REFLECTIVE
TYPE A	4" PLAIN WHITE NON-REFLECTIVE
TYPE C	RED-CLEAR REFLECTIVE
TYPE D	2 WAY YELLOW REFLECTIVE
TYPE G	1 WAY CLEAR REFLECTIVE
TYPE H	1 WAY YELLOW REFLECTIVE

STRIPES

- 4" WHITE STRIPE
- 4" YELLOW STRIPE

DIRECTION OF TRAFFIC

TWO-WAY LEFT-TURN LANES

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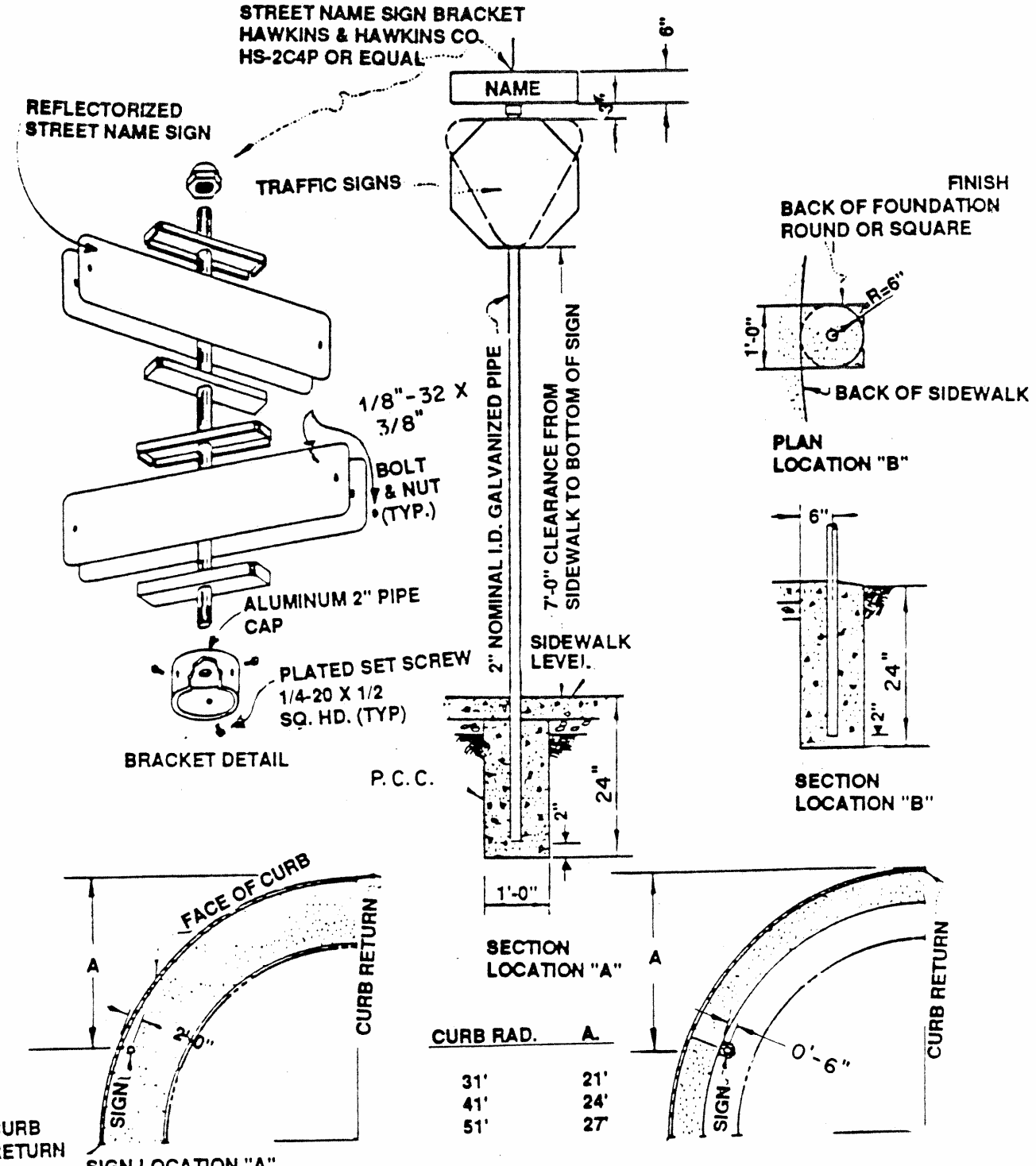
2000 STANDARD DETAILS



SIGNS: PRIVATE = WHITE ON BLUE
CITY = WHITE ON GREEN

LETTERING: STREET NAME - 4" "B" SERIES (USDOT FHWA STD.).
FOR STREET TYPE (e.g. "AVE.", "ROAD" ETC.) USE 2" SERIES.

STREET NAME SIGNS

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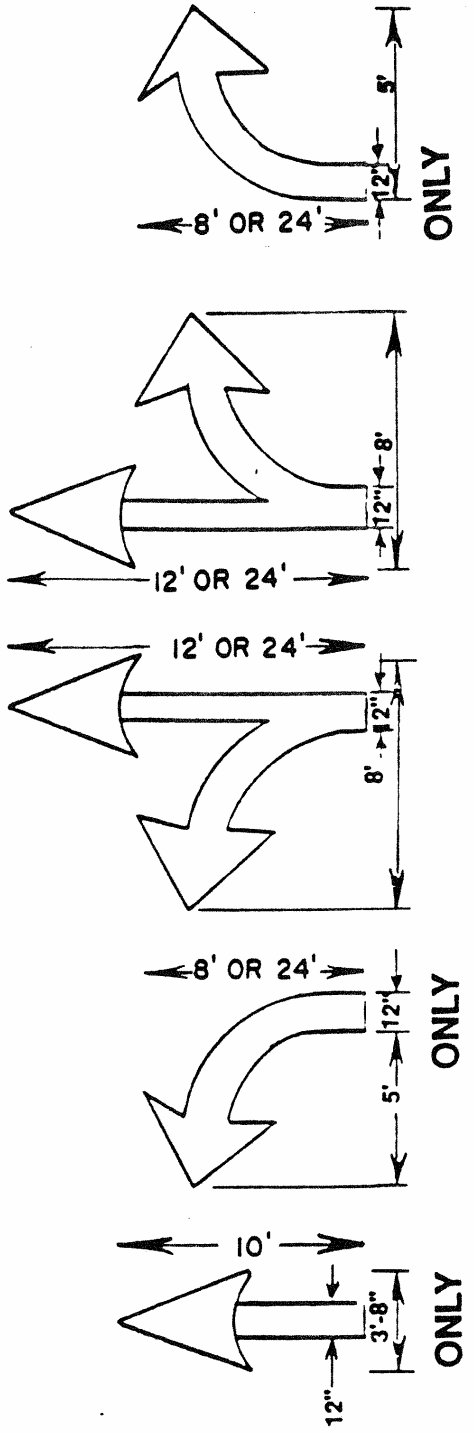
REV. DATE: JULY 2000

DRWG. 5E

(SEE DETAIL 6-64 OF CAL TRANS TRAFFIC MANUAL FOR ADDITIONAL INFORMATION ON LEGEND INSTALLATION)



PAVEMENT LEGENDS:
DIRECTIONAL ARROWS

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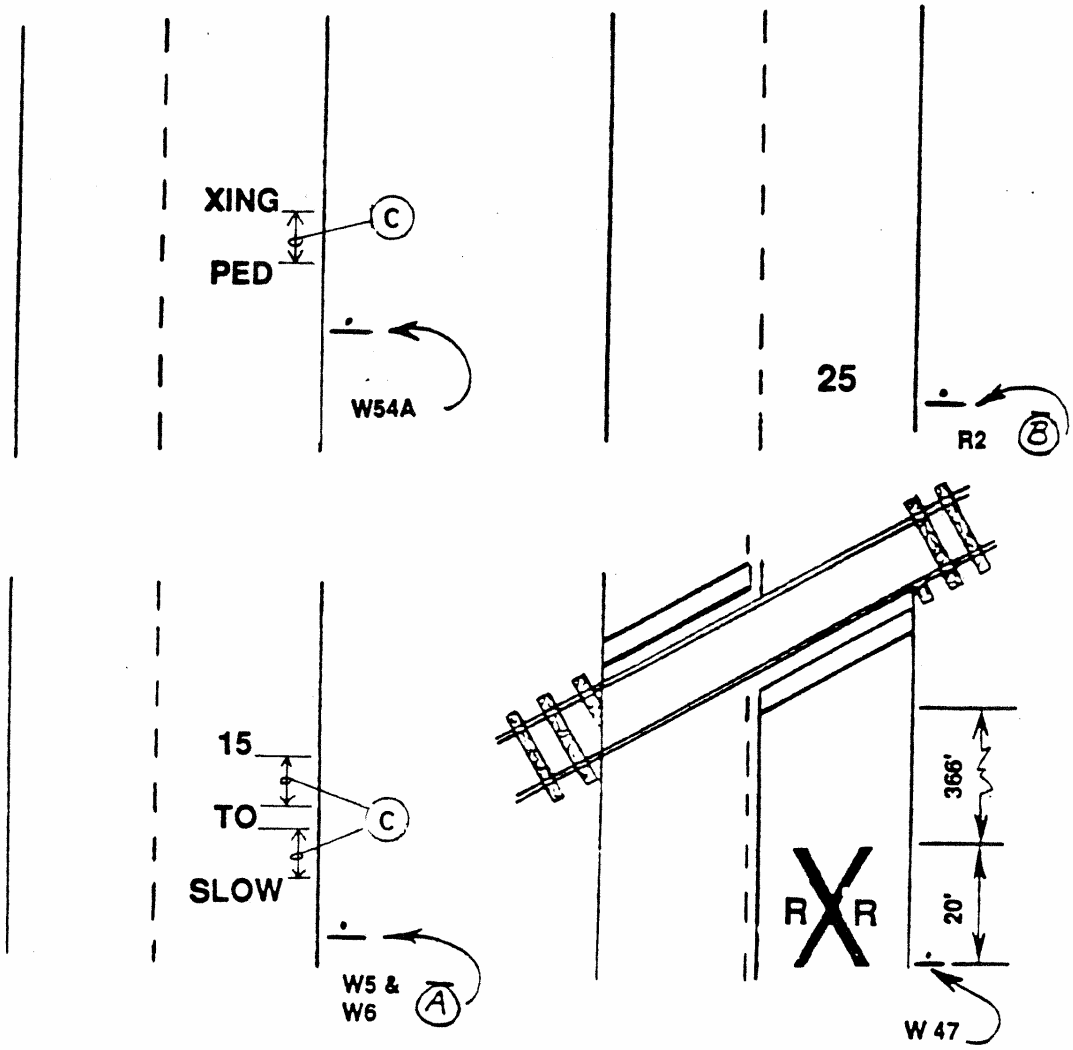
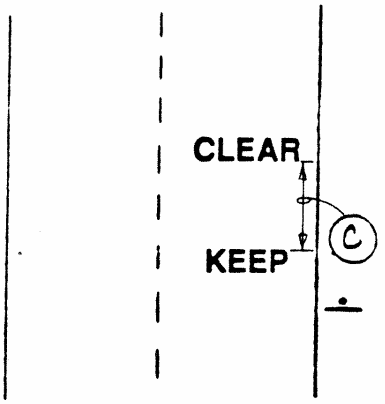
REV. DATE: JULY 2000

DRWG. 7E

2000 STANDARD DETAILS





(A) W3 MAY REPLACE THE W5. ENGINEER SHALL DETERMINE SPEED FOR W6 SIGN.

(B) ENGINEER SHALL DETERMINE SPEED LIMIT.

(C) DISTANCE BETWEEN MULTI-WORD LEGENDS LENGTH (L) IN FT. = SPEED LIMIT

NOTE:

SEE CALTRANS TRAFFIC MANUAL FOR SIGN TYPES AND LETTERING SIZE.

PAVEMENT LEGENDS:

SPEED ADVISORY

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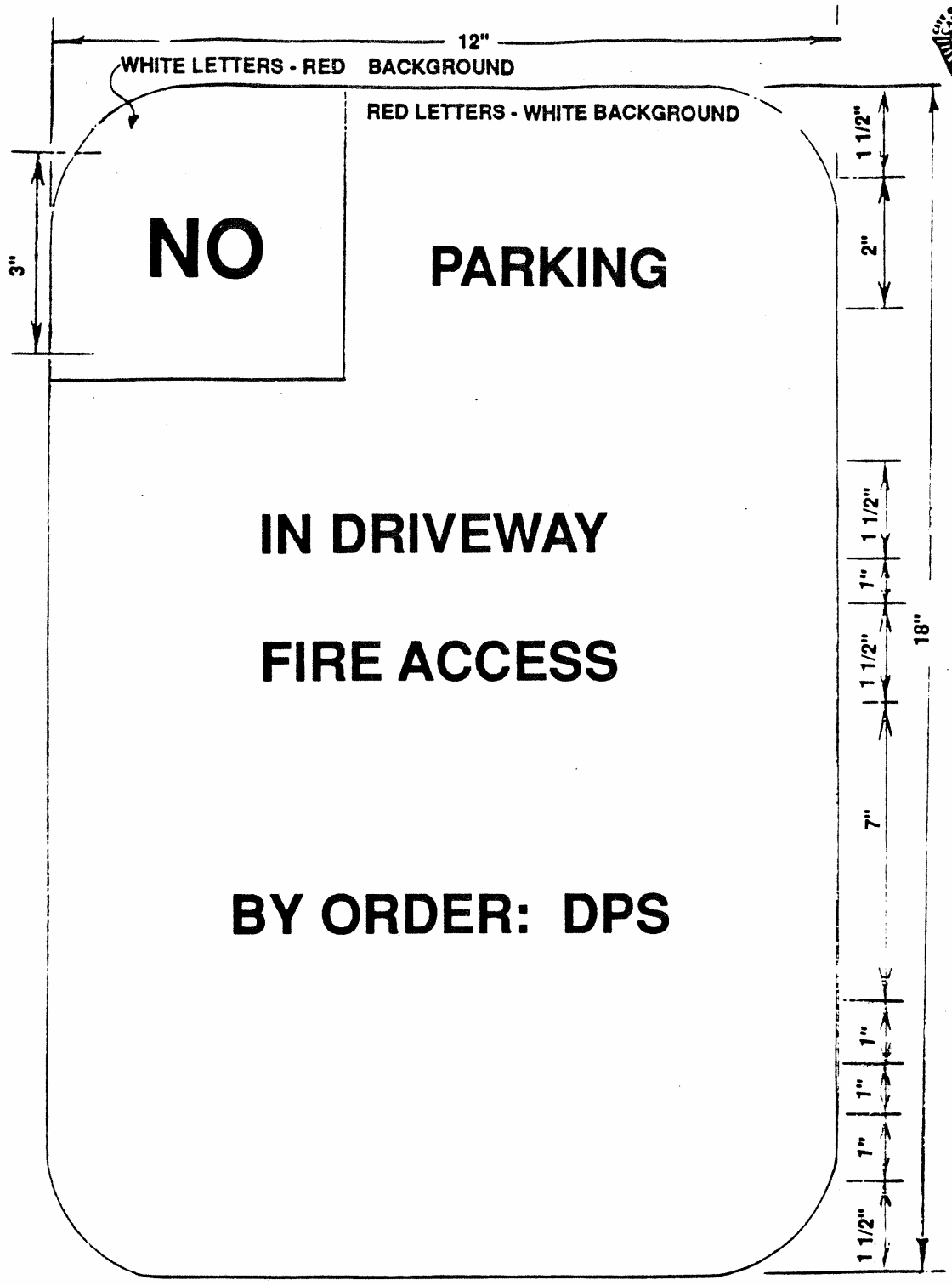
DRWG. 8E

2000 STANDARD DETAILS



FIRE ACCESS,

NO PARKING IN DRIVEWAY

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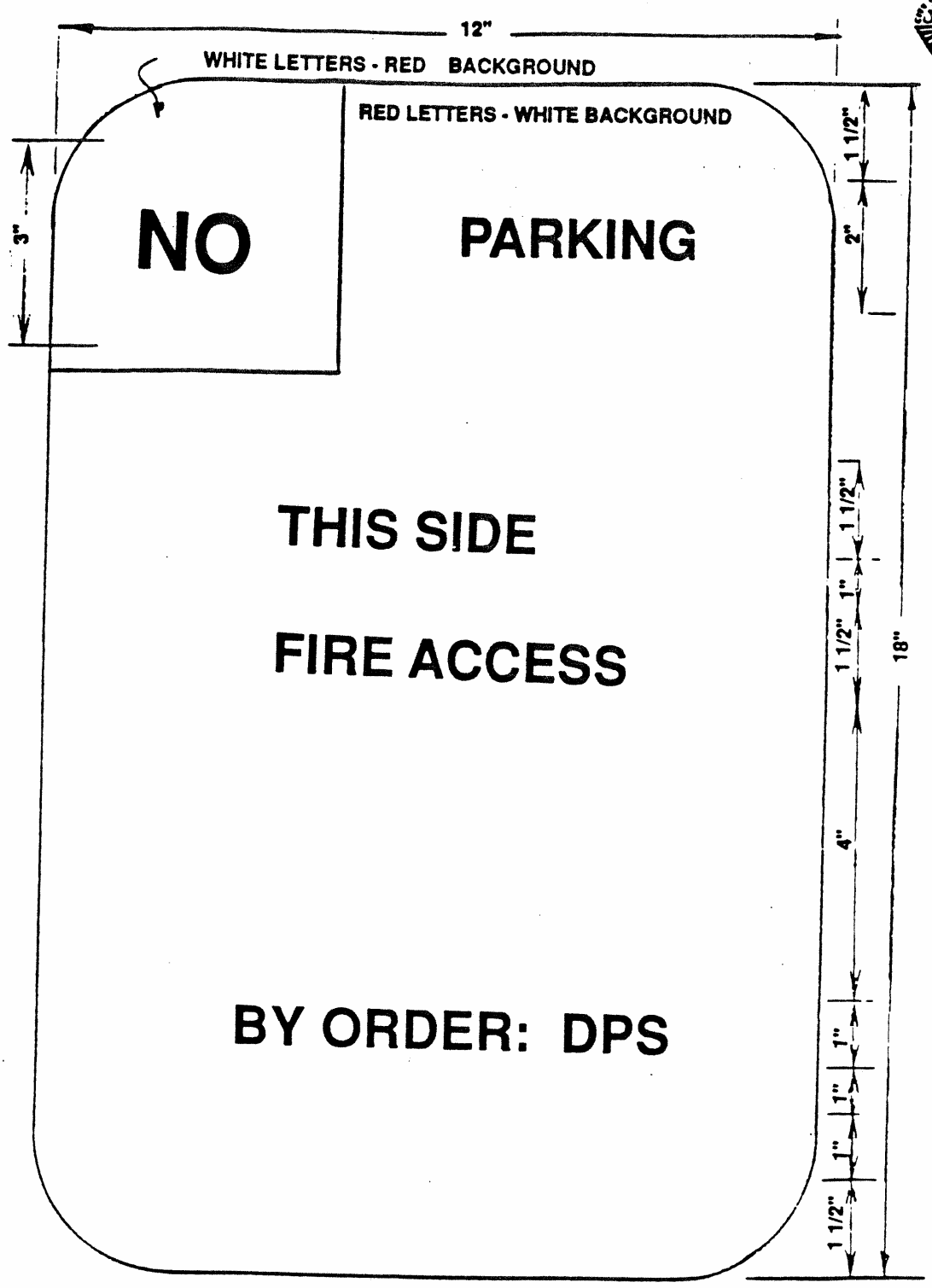
DATE: JUNE 30, 1991

REV. DATE: JULY 1998

DRWG. 11E

2000 STANDARD DETAILS



FIRE ACCESS,
NO PARKING THIS SIDE

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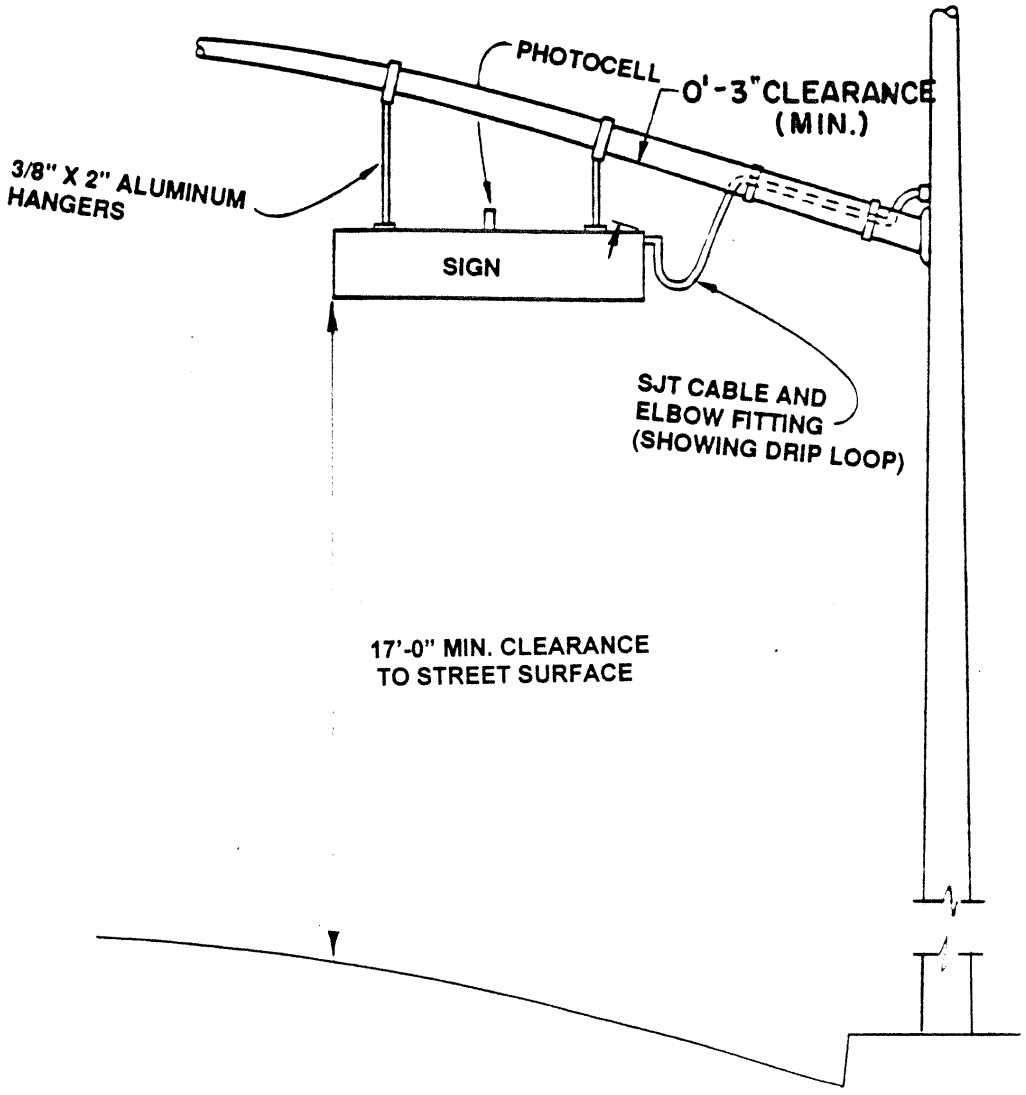
REV. DATE: JULY 1998

DRWG. 12E

2000 STANDARD DETAILS



INSTALLATION OF INTERNALLY ILLUMINATED STREET NAME SIGNS

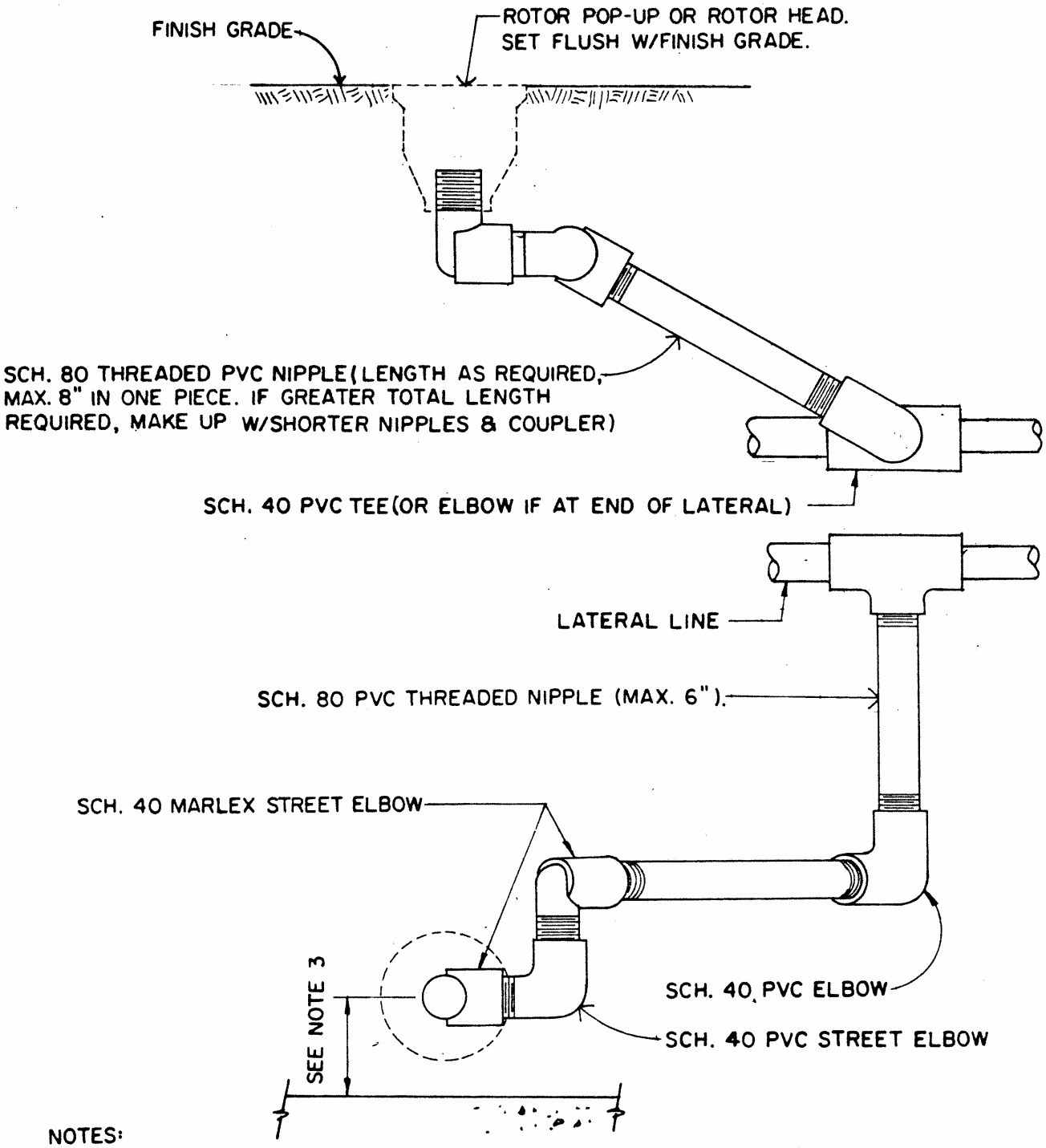
CITY OF SUNNYVALE CALIFORNIA

Marvin A. Rose
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 1998

13 E

2000 STANDARD DETAILS



NOTES:

1. INSTALL CHECK VALVE AT ALL HEADS SUBJECT TO LATERAL LINE DRAINAGE.
2. ADJUST ROTOR HEAD FOR MIN. OVERSPRAY ONTO ADJ. WALKS, ASPHALT, BLDGS, ETC.
3. LOCATE 12" AWAY FROM ADJ. BLDS OR FENCE. LOCATE MIN. 6" AWAY FOR ADJACENT SIDEWALKS, CURBS, OR HEADERBOARDS.
4. ALL JOINTS HAND TIGHT TO ALLOW MOVEMENT.

POP - UP ROTOR HEAD

CITY OF SUNNYVALE CALIFORNIA

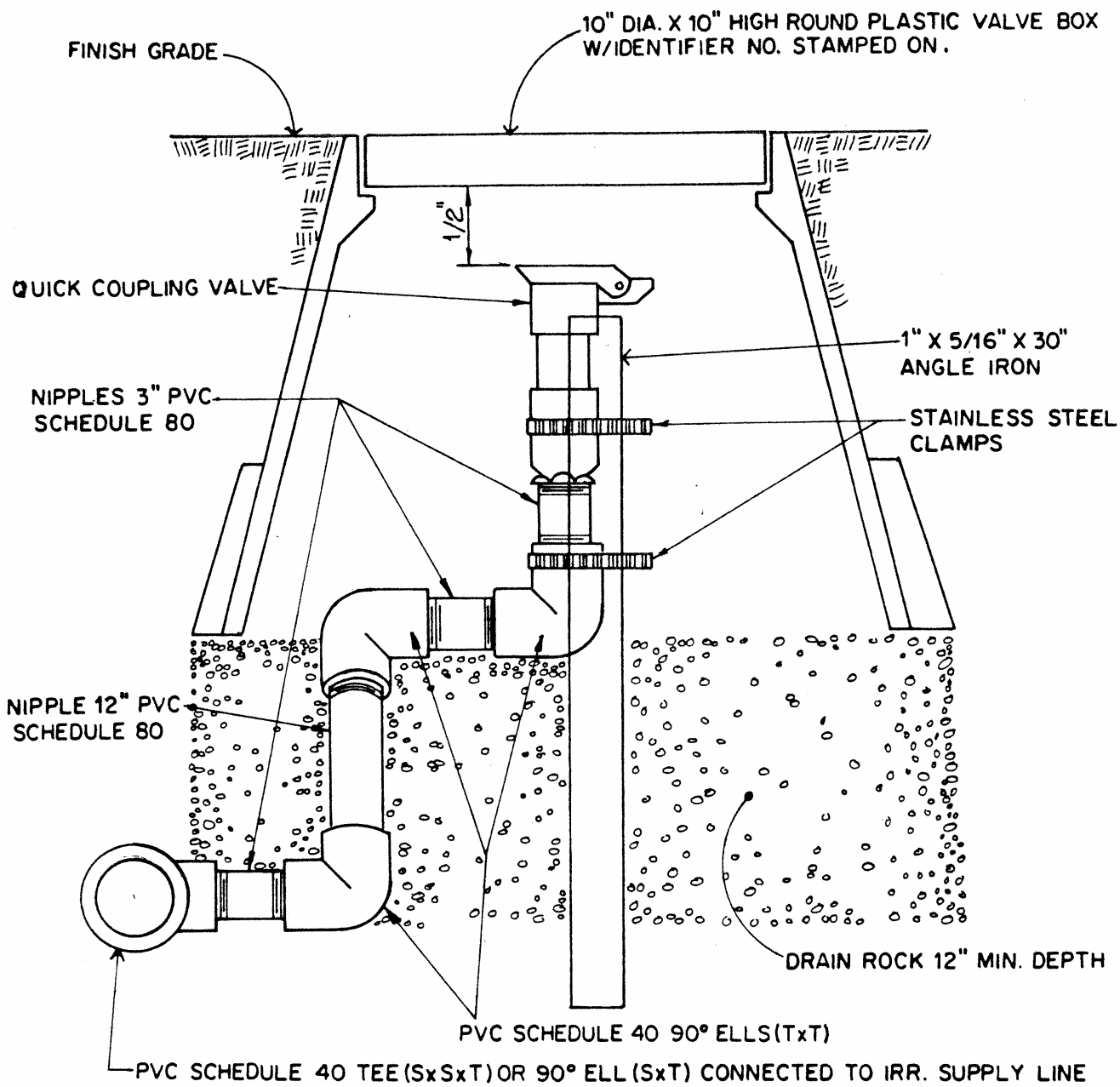
APPROVED

DATE

REV. DATE JULY 11, 2000

DRWG. 3F

2000 STANDARD DETAILS



NOTES:
1. LOCATE Q.C.V. ADJACENT TO R.C.V. IN GROUND COVER AREAS WHERE POSSIBLE.
2. LOCATE 12" AWAY FROM ADJACENT BUILDINGS OR FENCES. LOCATE MIN. 6" AWAY FROM ADJACENT SIDEWALKS, CURBS, OR HDRBOARDS.
3. INSTALL CHECK VALVE AT HEAD LOCATIONS THAT ARE SUBJECT TO LATERAL DRAINAGE.
4. ALL JOINTS HAND TIGHT TO ALLOW MOVEMENT.
5. SET TOP OF BOX 1" ABOVE FINISH GRADE IN SHRUB AREAS.

QUICK COUPLER VALVE

CITY OF SUNNYVALE, CALIFORNIA

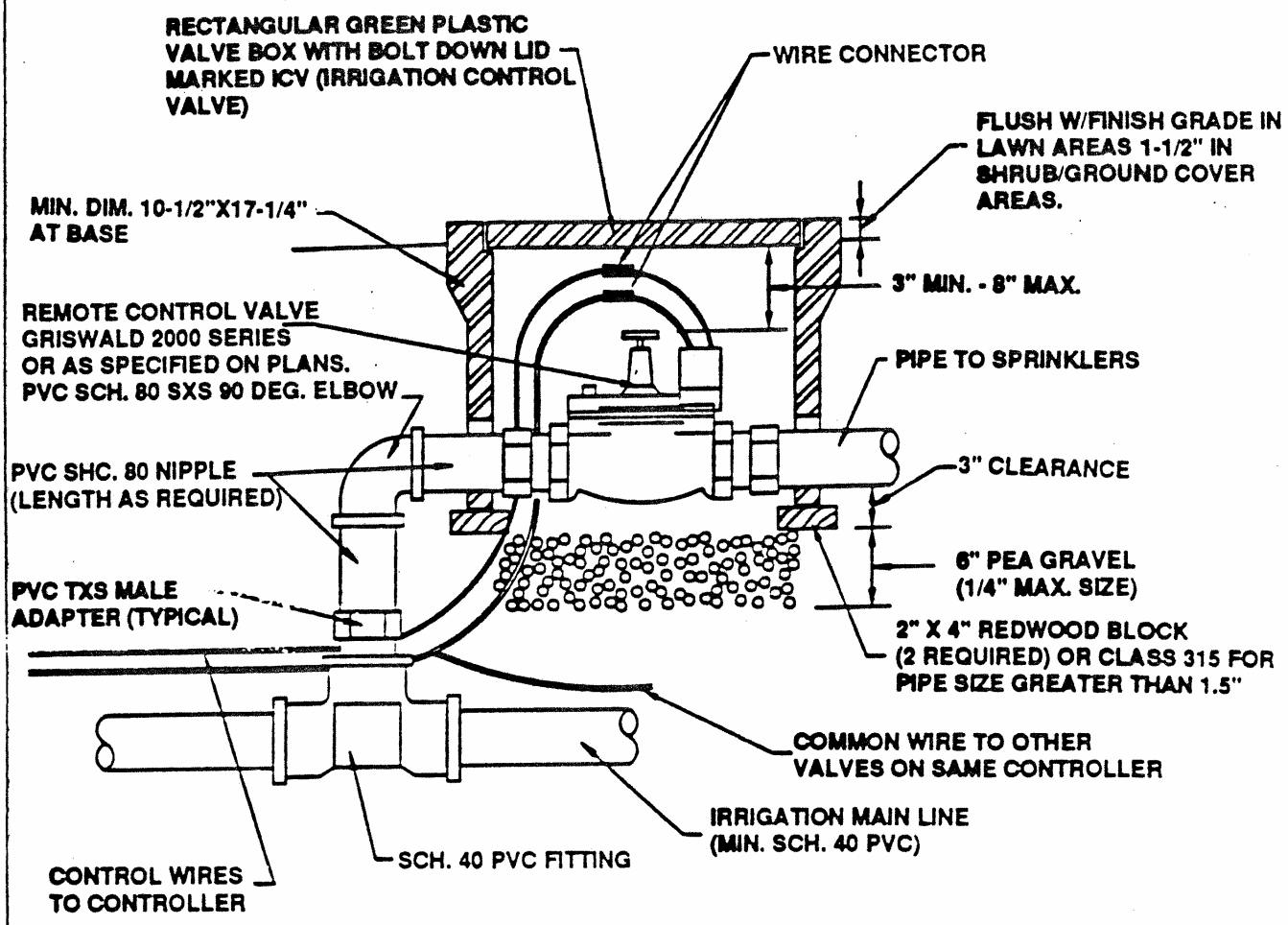
APPROVED

DATE

REV. DATE JULY 10, 2000

DRWG. 4F

2000 STANDARD DETAILS



NOTES:

1. PLACE VALVES IN CENTER OF MEDIAN ISLAND. IF LOCATED NEXT TO A SIDEWALK THE VALVE MUST BE A MINIMUM OF 16" FROM THE EDGE OF THE PATHWAY.
2. PLACE SHORT SIDE OF VALVE BOX PARALLEL TO ADJACENT WALK, CURB, ETC.
3. GROUP VALVE BOXES AND LOCATE IN SHRUB AND GROUND COVER AREAS WHEREVER POSSIBLE.
4. TAPE AND BUNDLE CONTROL WIRE EVERY 10 FEET. ALLOW SLACK FOR CONTRACTION.
5. LOOP A MINIMUM OF 3 FEET EXTRA CONTROL WIRE IN EACH VALVE BOX; BOTH CONTROL WIRE AND GROUND WIRE.
6. RUN EXTRA WIRES TO LAST VALVES AT EACH END OF PROJECT. THESE SPARES ARE TO BE A DIFFERENT COLOR FROM THE ONES IN USE.
7. ALL VALVE CONTROL WIRE SHALL BE COPPER UL APPROVED FOR DIRECT BURIAL IN GROUND.
8. PUBLIC AREAS: PROVIDE HEADERBOARD AROUND CLUSTER OF VALVE BOXES ADJACENT TO WALKS WITHIN TURF AREAS. ADD DECOMPOSED GRANITE BETWEEN BOXES AND HEADERBOARD.
9. LIMIT OF ONE RCV PER VALVE BOX.
10. THOROUGHLY FLUSH MAIN LINE BEFORE INSTALLING VALVE.

NO SCALE

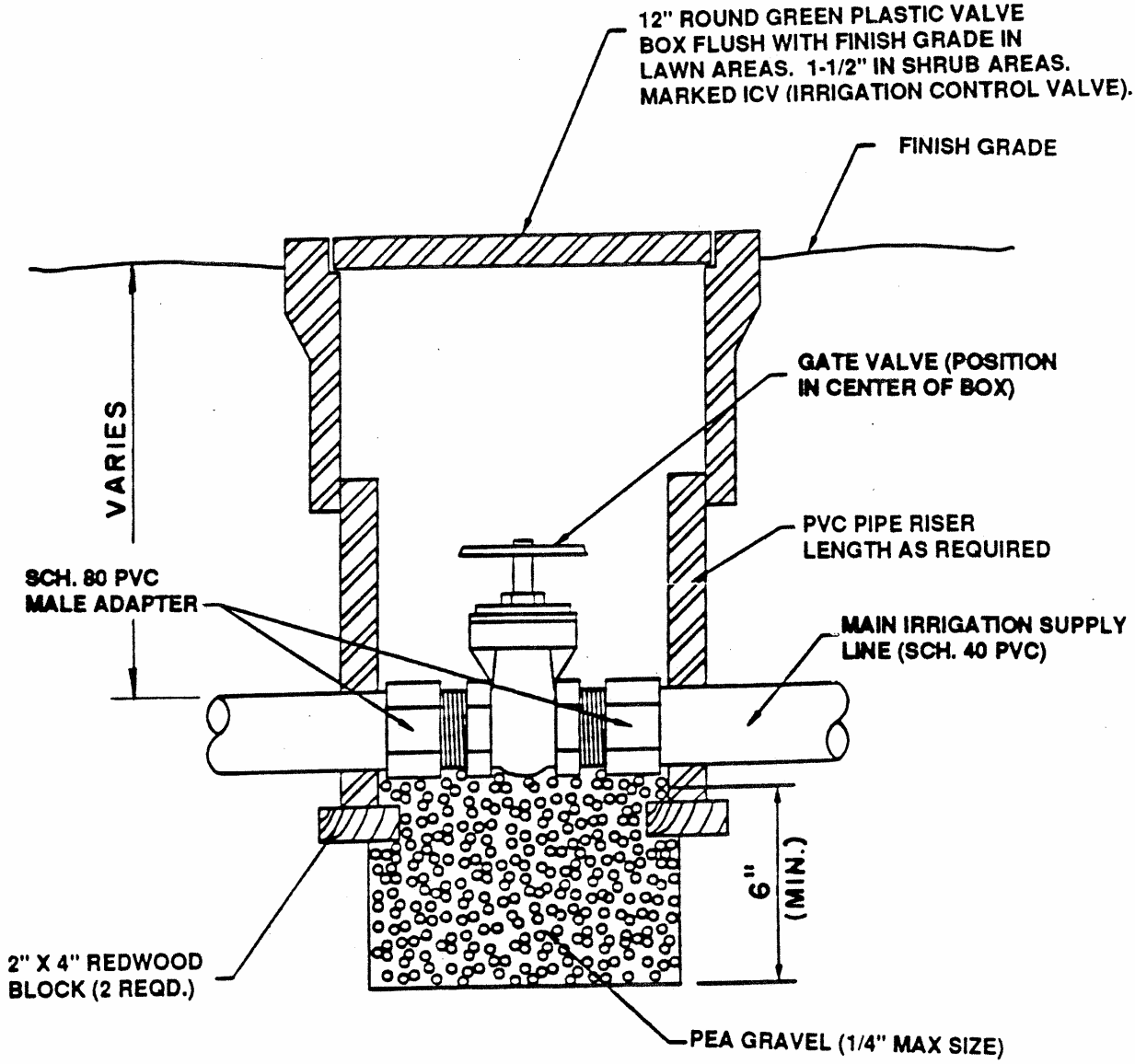
REMOTE CONTROL VALVE

APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 1998

DRWG. 6F

2000 STANDARD DETAILS



NO SCALE

GATE VALVE-IRRIGATION SYSTEM

CITY OF SUNNYVALE CALIFORNIA

Marvin A. Rose
APPROVED BY:

DATE: JUNE 30, 1991
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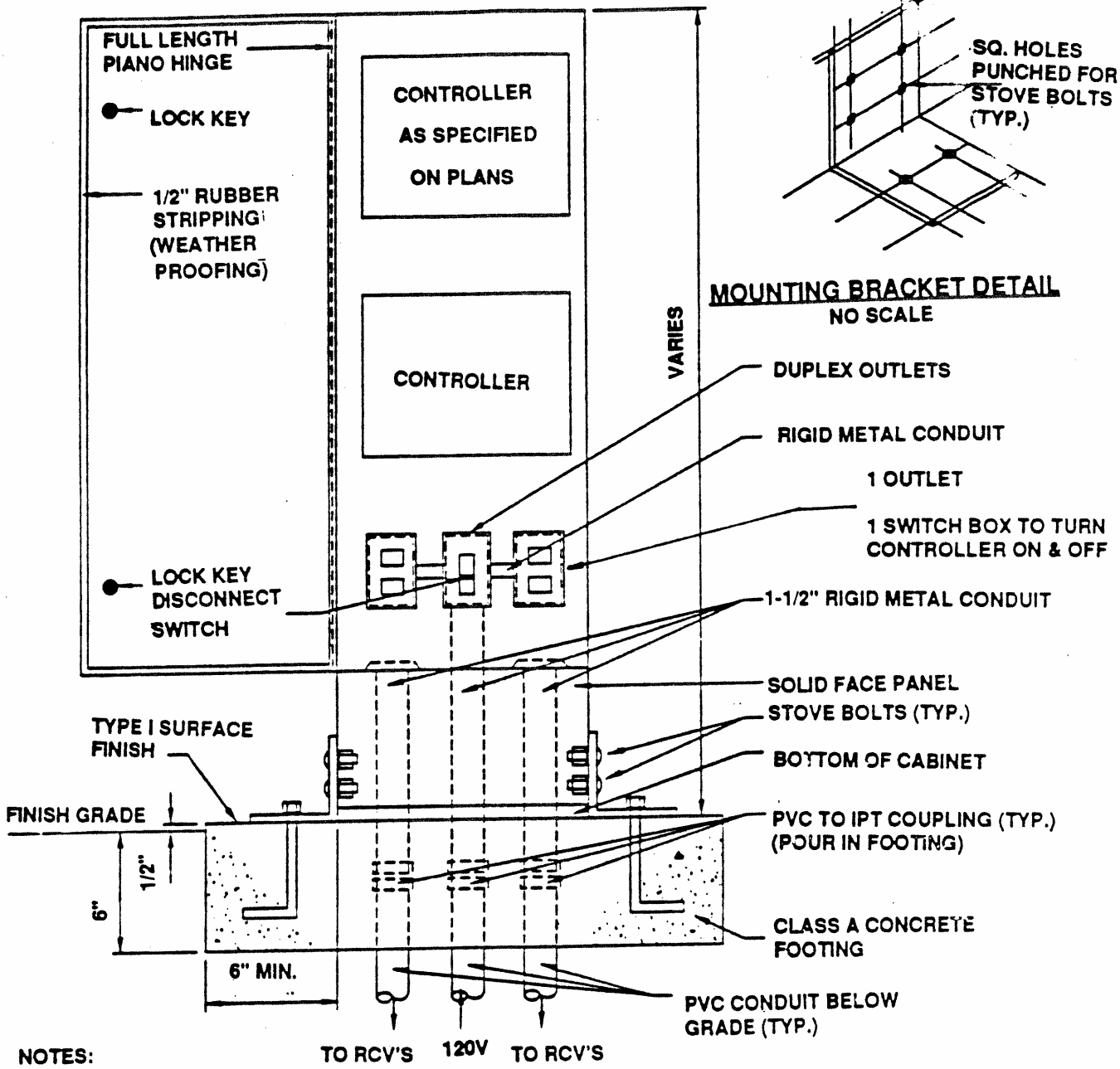
DRWG. 7F

2000 STANDARD DETAILS



MOUNTING BRACKET DETAIL
NO SCALE

NOTES:

1. STOVE BOLTS TO BE ROUND 1/4"X3/4" LONG CHROME PLATED WITH FLAT WASHER, LOCKWASHER AND NUT ON INSIDE OF CABINET.
2. CONTROLLER CABINET TO BE 16 GAUGE STEEL, VANDAL PROOF, PRIMED GREEN.
3. CABINET TO HAVE A VANDAL PROOF LOCKING MECHANISM KEYED TO KEYS FURNISHED BY OWNER.

NO SCALE

IRRIGATION CONTROLLER & CABINET

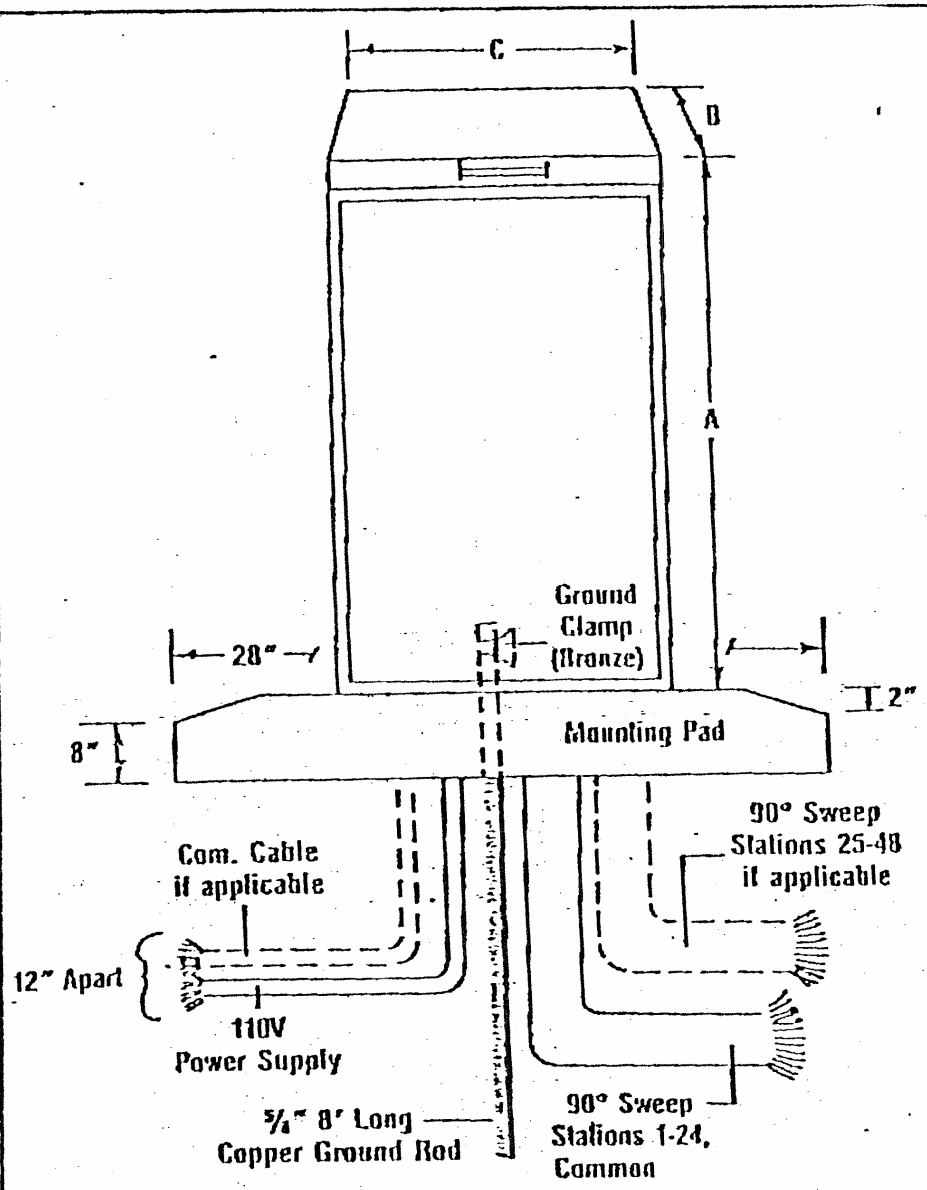
APPROVED BY:

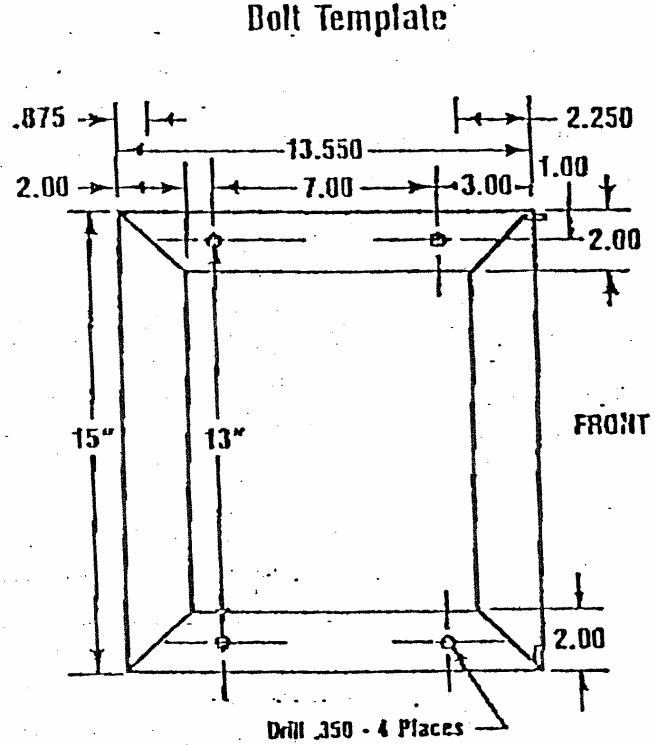
DATE: JUNE 30, 1991
REV. DATE: JULY 1998

DRWG. 8F

2000 STANDARD DETAILS

RAIN MASTER PEDESTAL
INSTALLATION DETAIL
Figure RMIS-EV10A





NOTE:
A) 37" Top Lid Closed, 49" Top Lid Open
B) 15.3" Door & Lid Closed, 30" Front Door Open
C) 15.3" Door Closed, 16.3" Front Door Open

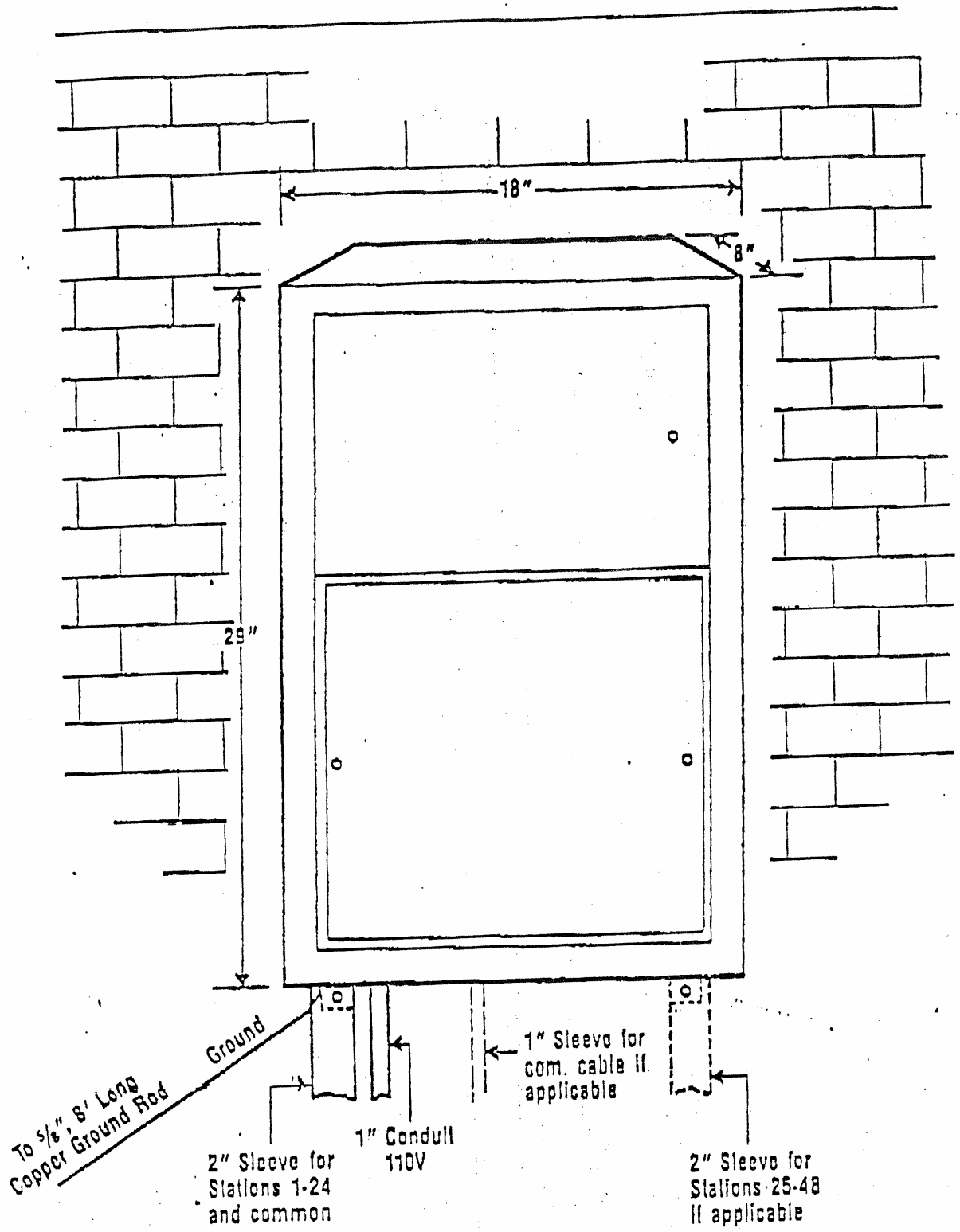
CITY OF SUNNYVALE, CALIFORNIA

APPROVED BY

DATE JUNE 30, 1991

REV. DATE JULY 1998

8F-2



RAIN MASTER WALL MOUNT INSTALLATION DETAIL

Figure RMIS-EV20

CITY OF SUNNYVALE CALIFORNIA

Marvin A. Rose
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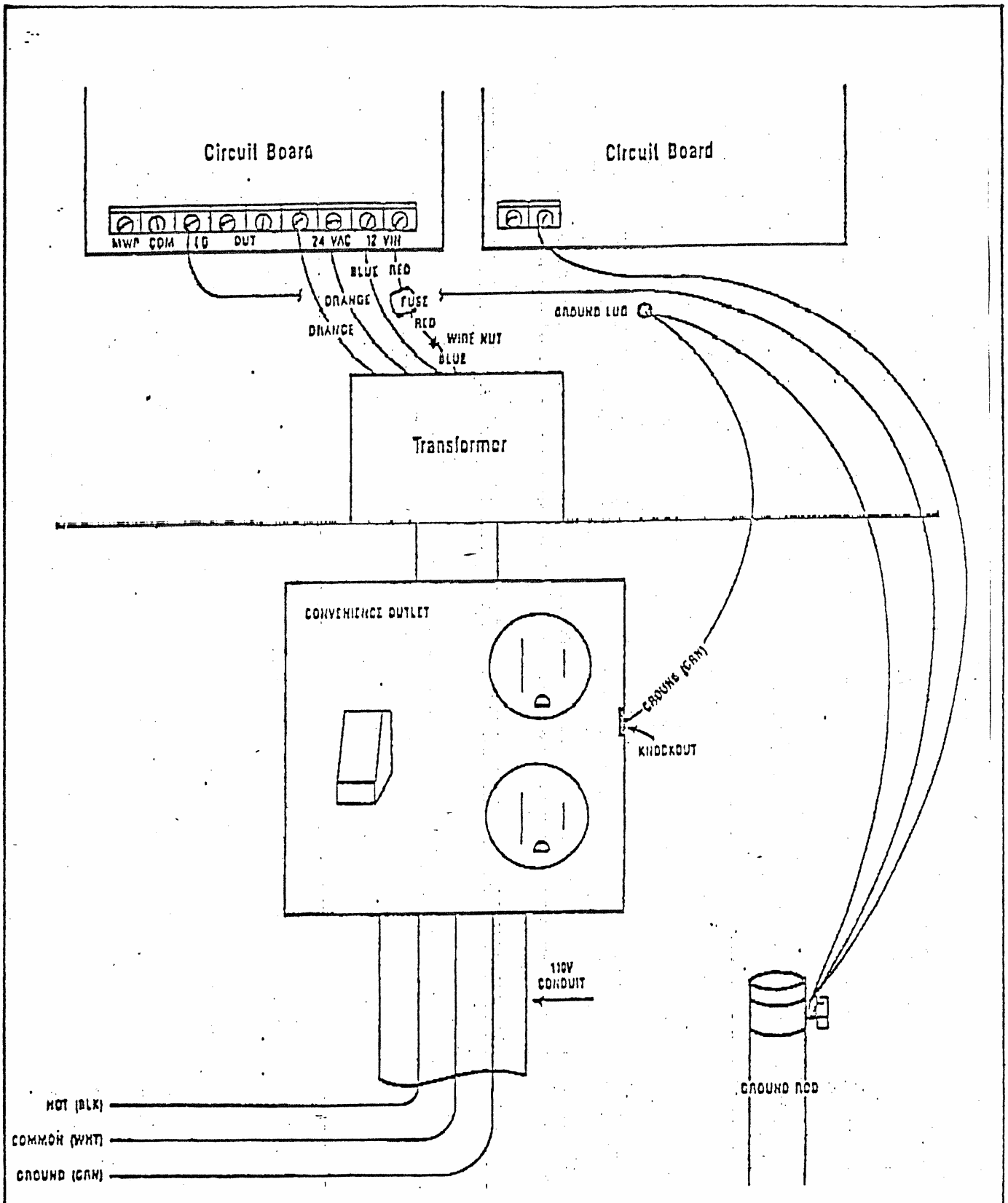
REV. DATE JULY 1998

8F-3



PRIMARY WIRING/GROUNDING DIAGRAM

RMIS-EV10C

CITY OF SUNNYVALE CALIFORNIA

Marvin A. Rose
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DATE JUNE 30, 1991
REV. DATE JULY 1998

8F-4

2000 STANDARD DETAILS

AUTOMATIC CONTROLLER

CITY OF SUNNYVALE CALIFORNIA

Marvin A. Rose
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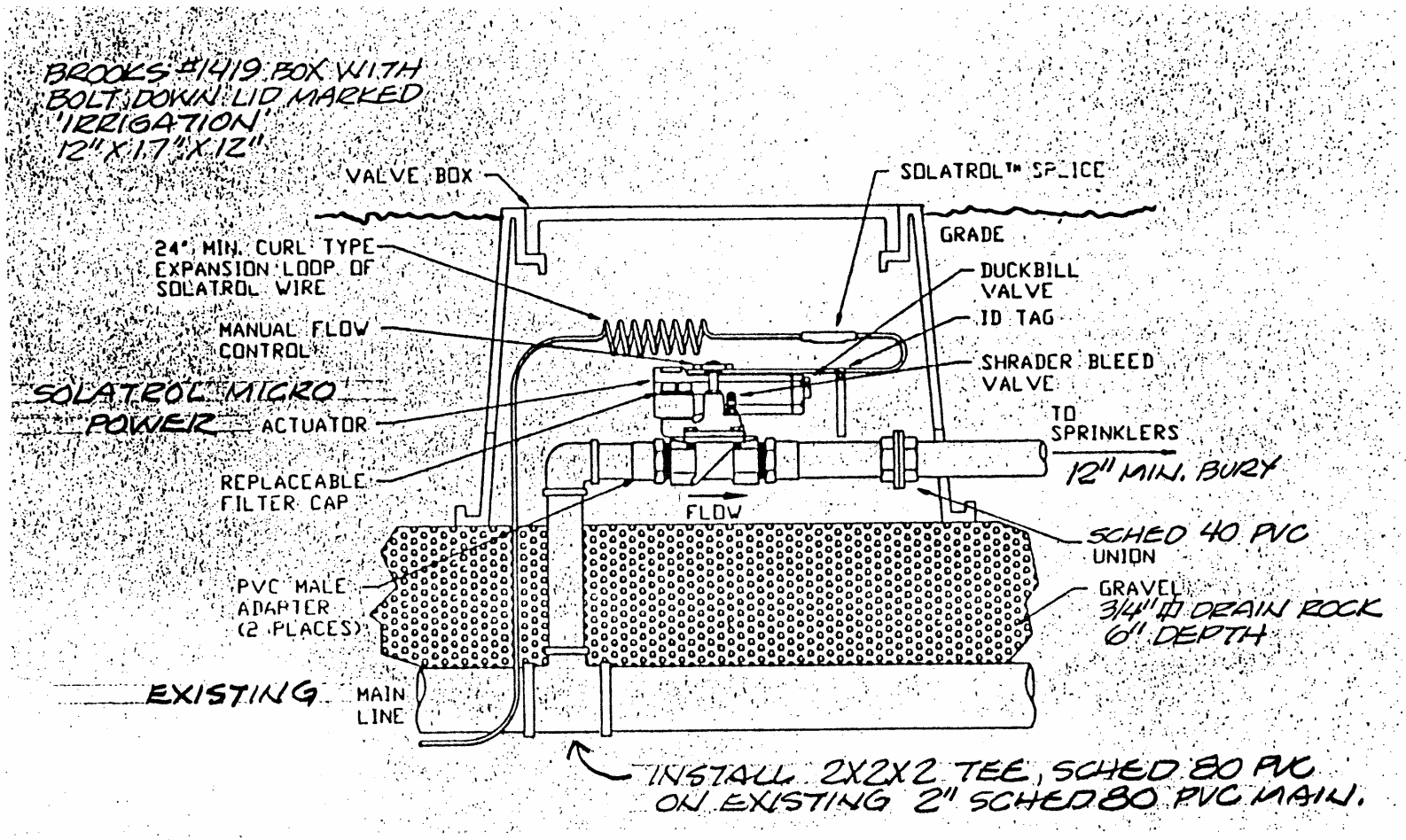
REV. DATE JULY 1998

8F-5

2000 STANDARD DETAILS

REMOTE CONTROL VALVE



APPROVED BY

DATE JUNE 30, 1991

REV. DATE JULY 1998

8F-6

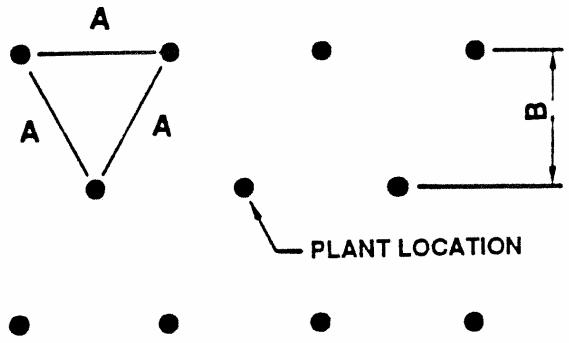
2000 STANDARD DETAILS

PLANT QUANTITY CHART (FOR GROUNDCOVER)

SPACING 'A'	SPACING 'B'	NO. OF PLANTS/SQ. FOOT
6" O.C.	5.2"	4.60
8" O.C.	6.9"	2.60
9" O.C.	7.8"	1.78
10" O.C	8.7"	1.66
12" O.C	10.4"	1.15
15" O.C.	13.0"	.74
18" O.C.	15.6"	.51
24" O.C.	20.8"	.29
30" O.C.	26.0"	.19
36" O.C.	30.0"	.12

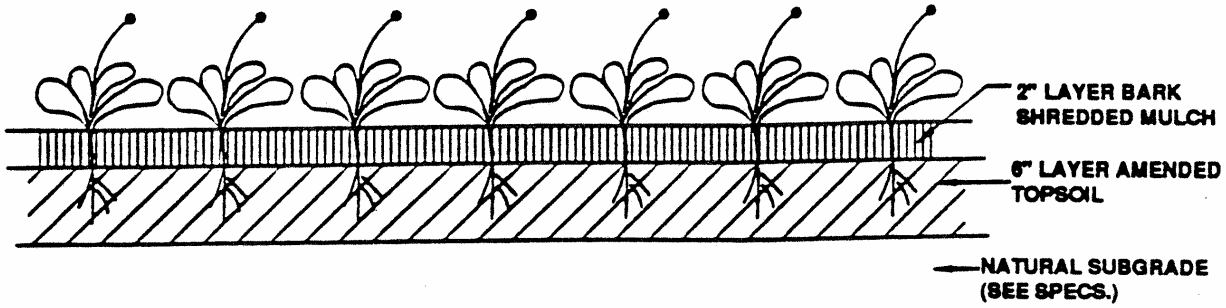
SEE GROUNDCOVER PLANT KEY FOR MAXIMUM TRIANGULAR SPACING "A". THIS CHART IS TO BE USED TO DETERMINE NUMBER OF GROUNDCOVER PLANTS REQUIRED IN A GIVEN AREA.

PLANT SPACING CHART



FOR USE WHEN PLANTS ARE SPACED EQUIDISTANT FROM EACH OTHER AS IN ALL GROUNDCOVER PLANTINGS AND MASSED SHRUB PLANTINGS.

GROUNDCOVER



NO SCALE

GROUND COVER PLANTING

CITY OF SUNNYVALE CALIFORNIA

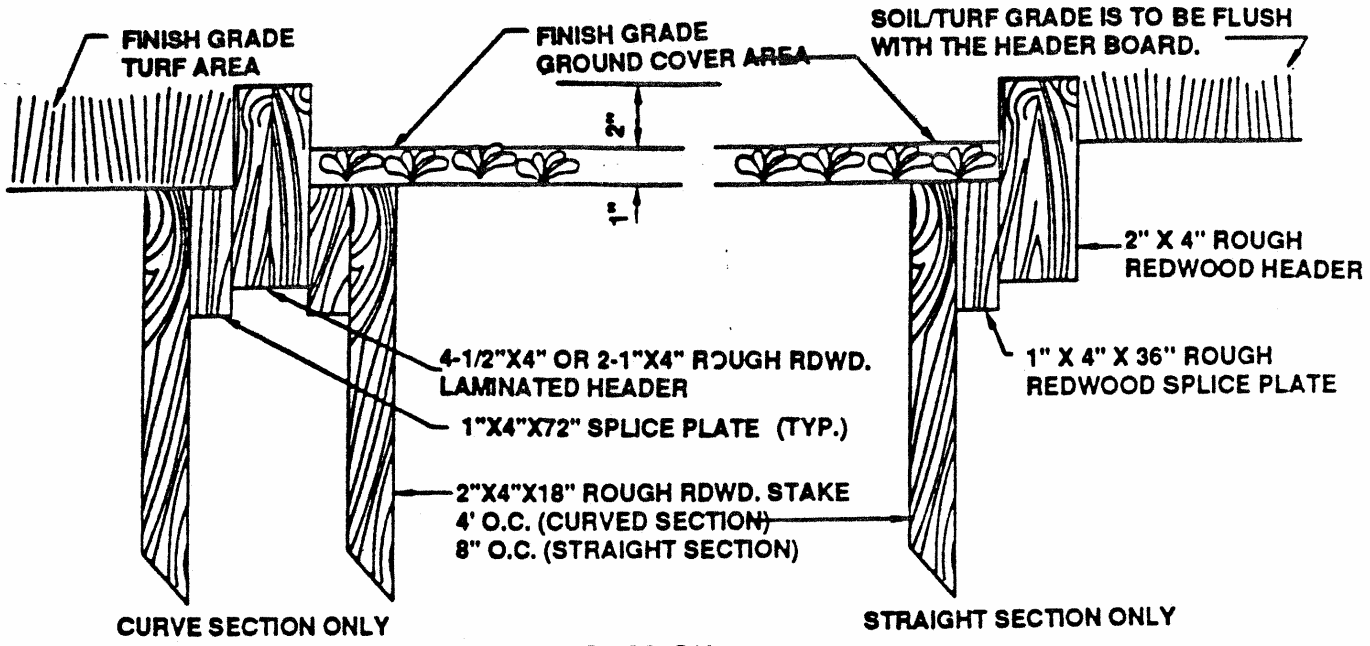
APPROVED BY:

DATE: JUNE 30, 1991

REV. DATE: JULY 1998

DRWG. 9F

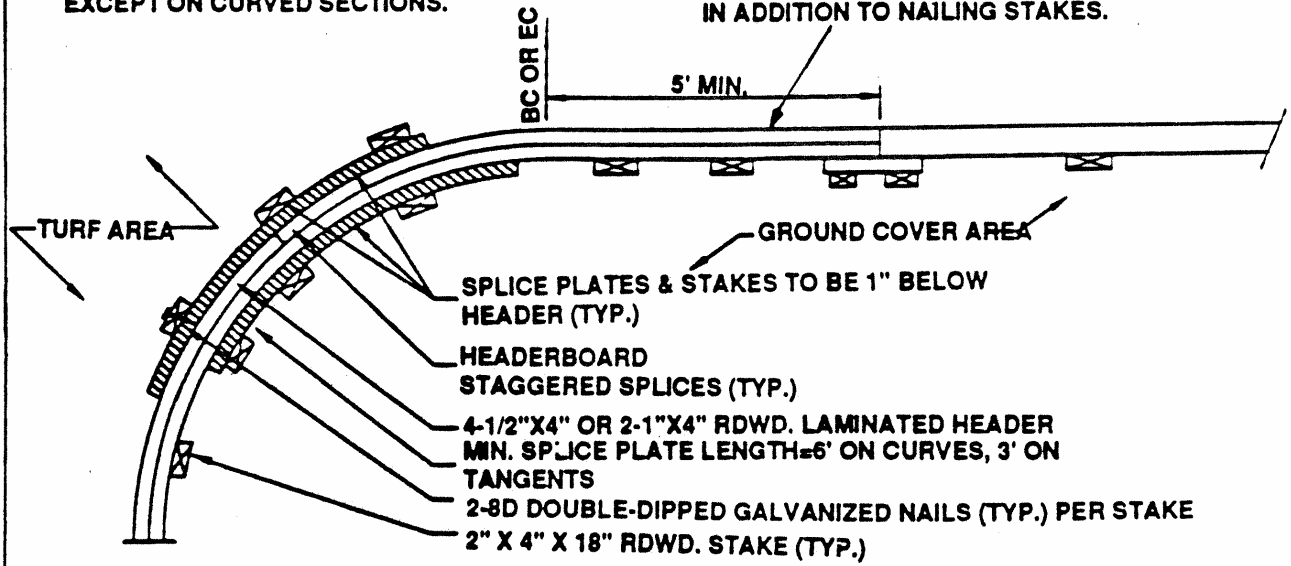
2000 STANDARD DETAILS



SECTION

NOTES:

1. INSTALL HEADER BOARDS TO DIVIDE TURF GROUND COVER AREAS.
2. ALL REDWOOD SHALL BE CONSTRUCTION HEART GRADE.
3. ALL STAKES SHALL BE INSTALLED ON GROUND COVER SIDE OF RDWD. HEADER EXCEPT ON CURVED SECTIONS.



NO SCALE

REDWOOD HEADER

LANDSCAPE AREAS

CITY OF SUNNYVALE, CALIFORNIA

APPROVED BY:

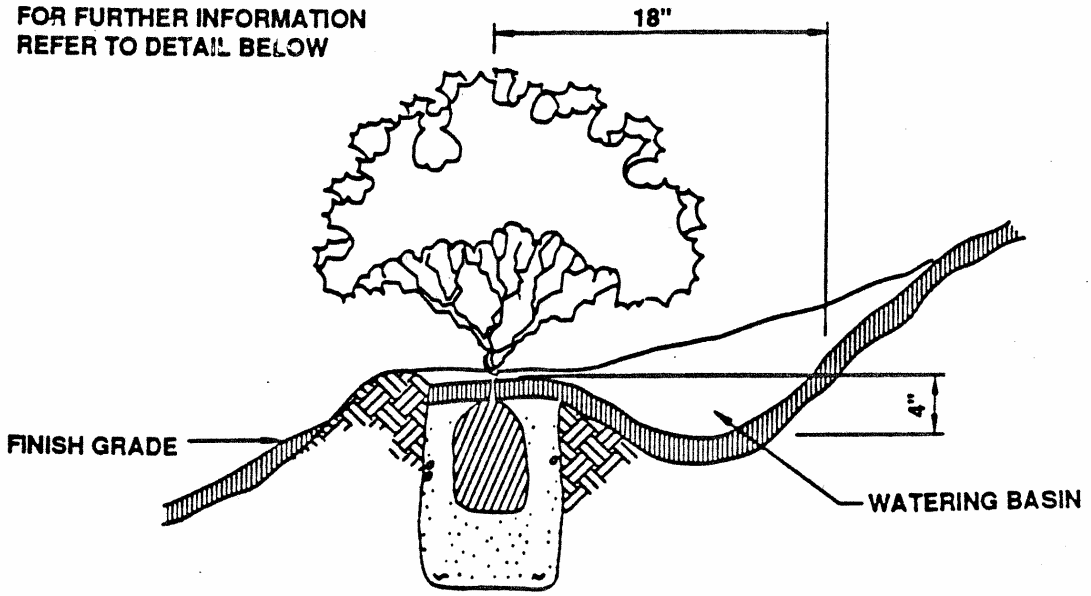
DATE: JUNE 30, 1991

REV. DATE: JULY 1998

DRWG. 10F

2000 STANDARD DETAILS

FOR FURTHER INFORMATION
REFER TO DETAIL BELOW

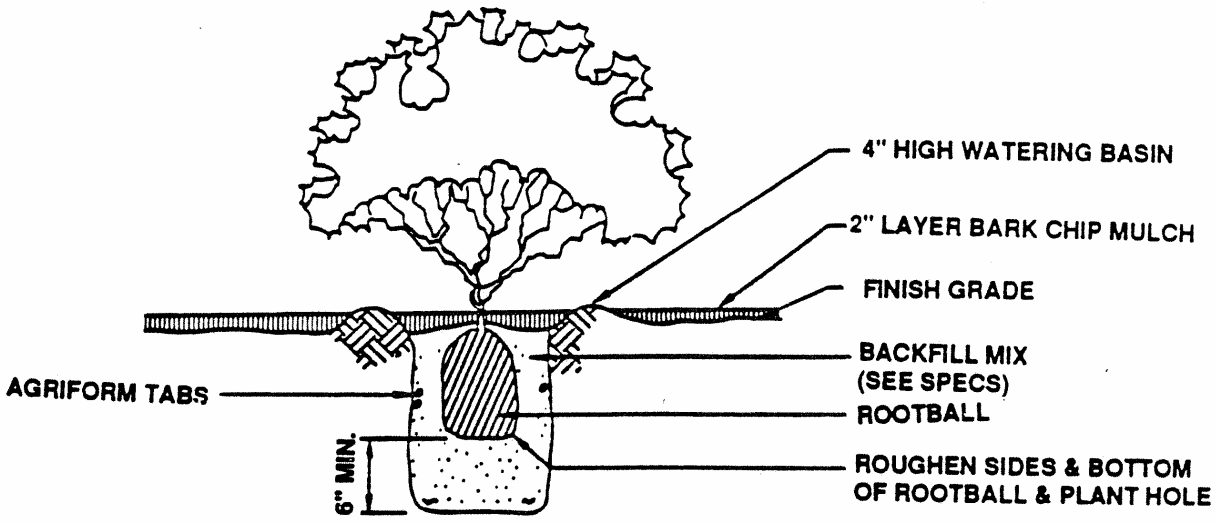


SHRUB PLANTING ON SLOPES 3:1
NO SCALE

NOTE:
BACKFILL W/50% NATIVE SOIL AND 50% AMENDED SOIL AS APPROVED BY THE CITY.

NOTE:

PLANT PIT TO BE MINIMUM 1.5X WIDTH & 1.5X HEIGHT OF ROOTBALL



SHRUB PLANTING ON SLOPES LESS THAN 3:1
NO SCALE

NO SCALE

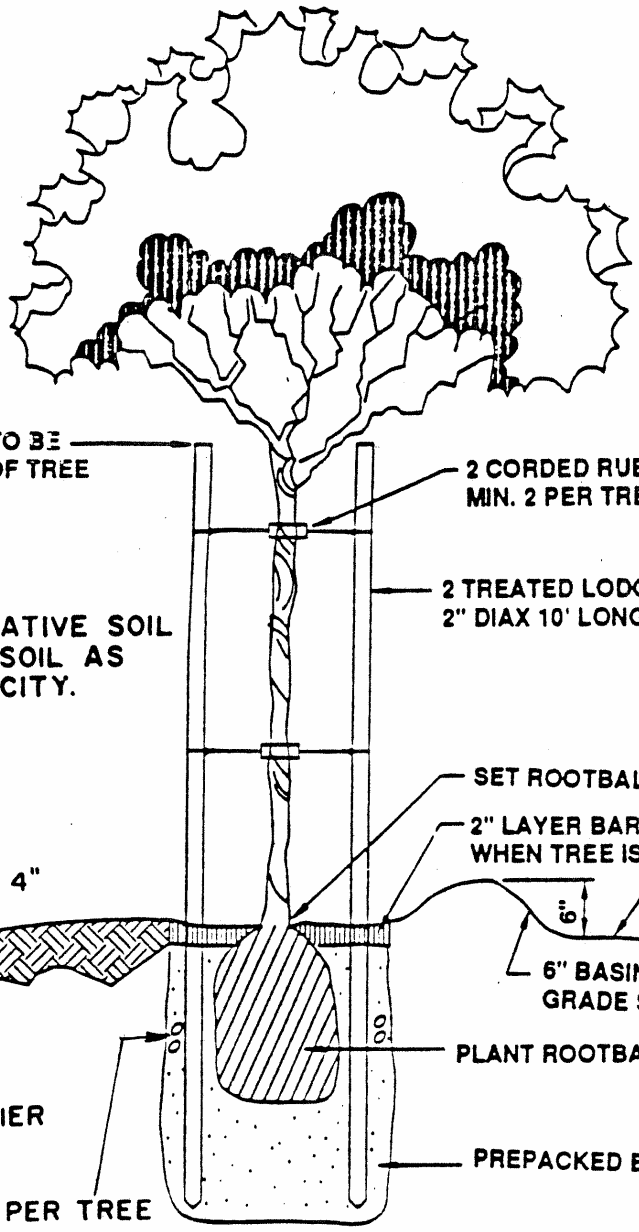
SHRUB PLANTING ON SLOPES

APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 1998

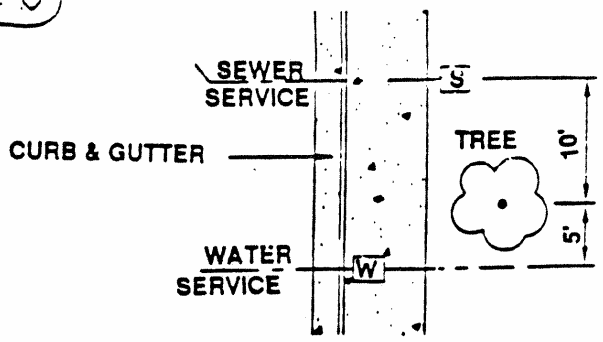
DRWG. 11F

2000 STANDARD DETAILS



NOTE:

1. PLANT PIT TO BE MIN. 1.5 TIMES WIDTH OF PLANT CONTAINER & 2 TIMES HEIGHT.
2. IN TURF AREAS, EDGE OF SOD/SEED TO BE 10" CLEAR FROM BASE OF TRUNK.
3. ROUGHEN SIDES & BOTTOM OF ROOTBALL & PLANT HOLE.
4. PLANT TREES NO CLOSER THAN 5' FROM WATER SERVICES AND 10' FROM SEWER LATERALS, 5' FROM WALKS.



LOCATION PLAN

NO SCALE

STREET TREE PLANTING

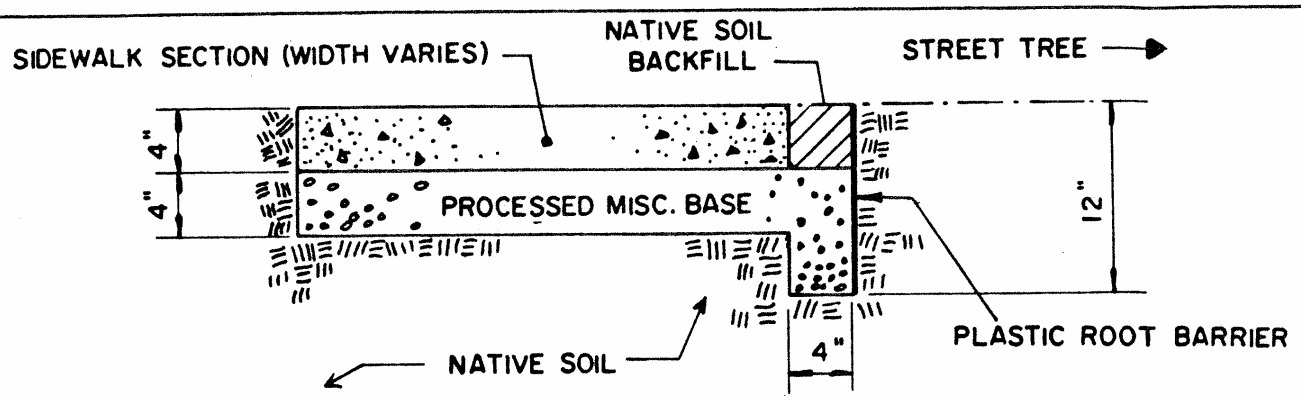
CITY OF SUNNYVALE CALIFORNIA

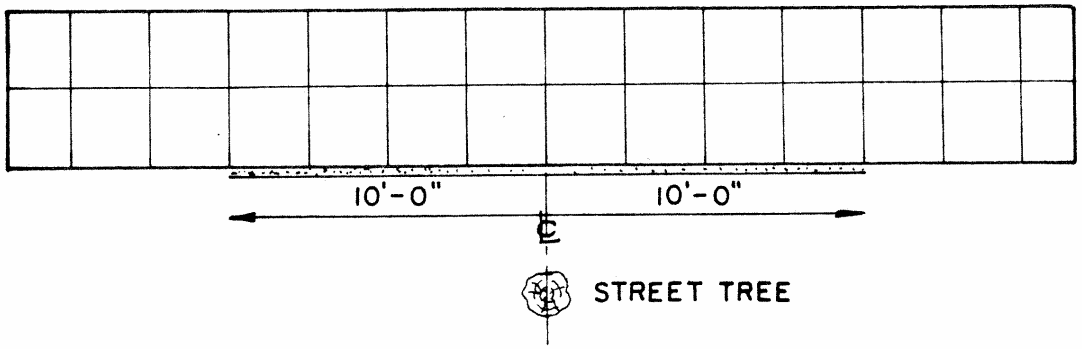
Marvin A. Rose
APPROVED BY:

DATE: JUNE 30, 1991
REV. DATE: JULY 2000

DRWG. 12F

2000 STANDARD DETAIL





1. PLASTIC ROOT BARRIER SHALL BE MINIMUM 40 MIL THICK HIGH DENSITY POLYETHYLENE PLASTIC SHEETING TWELVE (12) INCHES WIDE.
2. THE PLASTIC ROOT BARRIER SHALL BE INSTALLED FOUR (4) INCHES FROM THE CONCRETE EDGE ON THE TREE SIDE OF THE ROOT BARRIER TRENCH.
3. THE PLASTIC ROOT BARRIER SHALL BE A CONTINUOUS SHEET ITS ENTIRE INSTALLED LENGTH.
4. THE PLASTIC ROOT BARRIER SHALL BE INSTALLED TO A MINIMUM LENGTH OF TEN FEET EITHER SIDE OF THE CENTER LINE OF THE STREET TREE.
5. THE PLASTIC ROOT BARRIER SHALL EXTEND TO THE SOIL SURFACE. THE TOP EDGE OF ROOT BARRIER SHOULD BE AT GRADE AND VISIBLE AFTER INSTALLATION.
6. PROCESSED MISC. BASE SHALL BE INSTALLED IN BOTTOM OF ROOT BARRIER TRENCH UP TO BASE OF SIDEWALK. BASE ROCK SHALL BE COMPACTED TO 95% PROCTOR DENSITY.
7. NATIVE SOIL SHALL FILL TOP FOUR (4) INCHES OF ROOT BARRIER TRENCH. THIS SOIL DOES NOT REQUIRE COMPACTION.
8. IT IS IMPERATIVE THAT BASE ROCK IN ROOT BARRIER TRENCH BE COMPACTED. IF MATERIAL IN ROOT BARRIER TRENCH IS NOT COMPACTED, ROOTS WILL GROW INTO THIS AREA AND TRAVEL IN INTERFACES BETWEEN BASE OF CONCRETE AND BASE ROCK DEFEATING THE FUNCTION OF ROOT BARRIER INSTALLATION.

ROOT CONTROL BARRIER INSTALLATION AT SIDEWALK

CITY OF SUNNYVALE CALIFORNIA

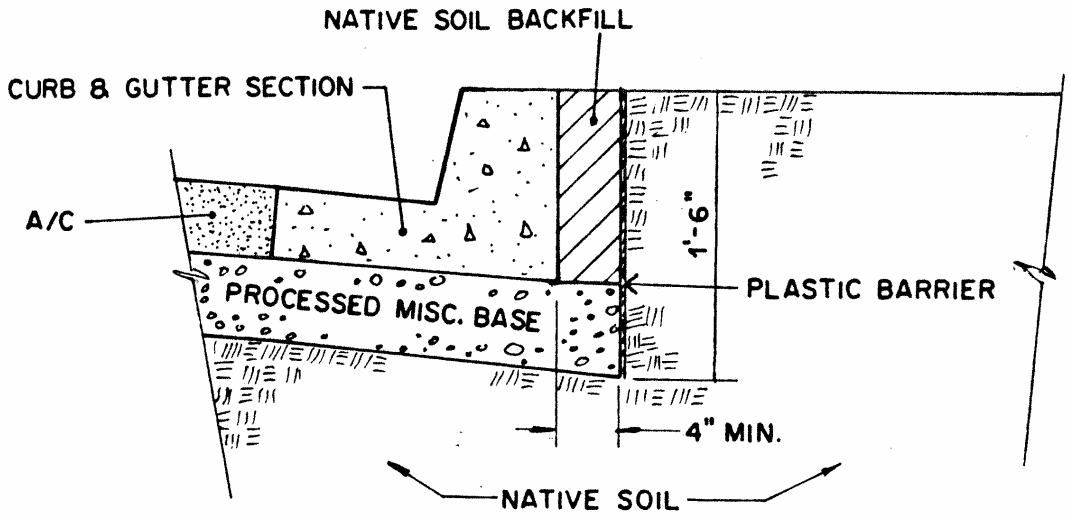
APPROVED

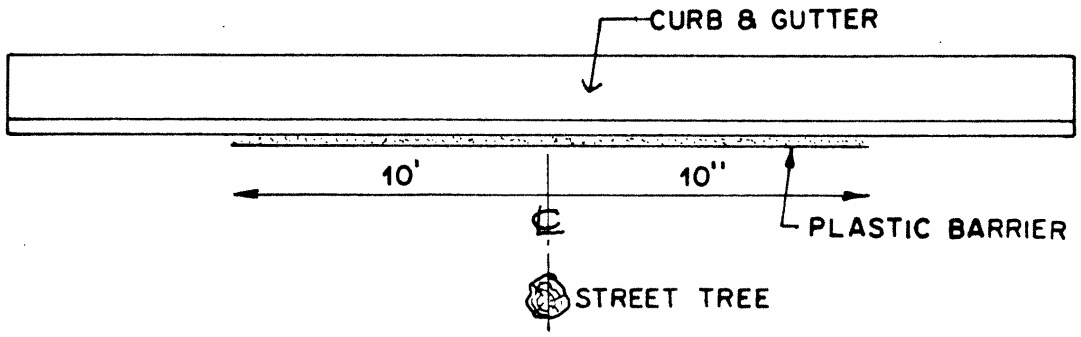
DATE JUNE 21, 2000

REV. DATE

DRWG. 13 F

2000 STANDARD DETAILS





1. PLASTIC ROOT BARRIER SHALL BE MINIMUM 40 MIL THICK HIGH DENSITY POLYETHYLENE PLASTIC SHEETING EIGHTEEN (18) INCHES WIDE.
2. THE PLASTIC ROOT BARRIER SHALL BE INSTALLED FOUR (4) INCHES FROM THE CONCRETE EDGE ON THE TREE SIDE OF THE ROOT BARRIER TRENCH.
3. THE PLASTIC ROOT BARRIER SHALL BE A CONTINUOUS SHEET ITS ENTIRE INSTALLED LENGTH.
4. THE PLASTIC ROOT BARRIER SHALL BE INSTALLED TO A MINIMUM LENGTH OF TEN FEET EITHER SIDE OF THE CENTER LINE OF THE STREET TREE.
5. THE PLASTIC ROOT BARRIER SHALL EXTEND TO THE SOIL SURFACE. THE TOP EDGE OF ROOT BARRIER SHOULD BE AT GRADE AND VISIBLE AFTER INSTALLATION.
6. PROCESSED MISC. BASE SHALL BE INSTALLED IN BOTTOM OF ROOT BARRIER TRENCH UP TO BASE OF SIDEWALK. BASE ROCK SHALL BE COMPACTED TO 95% PROCTOR DENSITY.
7. NATIVE SOIL SHALL FILL TOP TWELVE(12) INCHES OF ROOT BARRIER TRENCH. THIS SOIL DOES NOT REQUIRE COMPACTION.
8. IT IS IMPERATIVE THAT BASE ROCK IN ROOT BARRIER TRENCH BE COMPACTED. IF MATERIAL IN ROOT BARRIER TRENCH IS NOT COMPACTED, ROOTS WILL GROW INTO THIS AREA AND TRAVEL IN INTERFACES BETWEEN BASE OF CONCRETE AND BASE ROCK DEFEATING THE FUNCTION OF ROOT BARRIER INSTALLATION.

ROOT CONTROL BARRIER INSTALLATION AT CURB

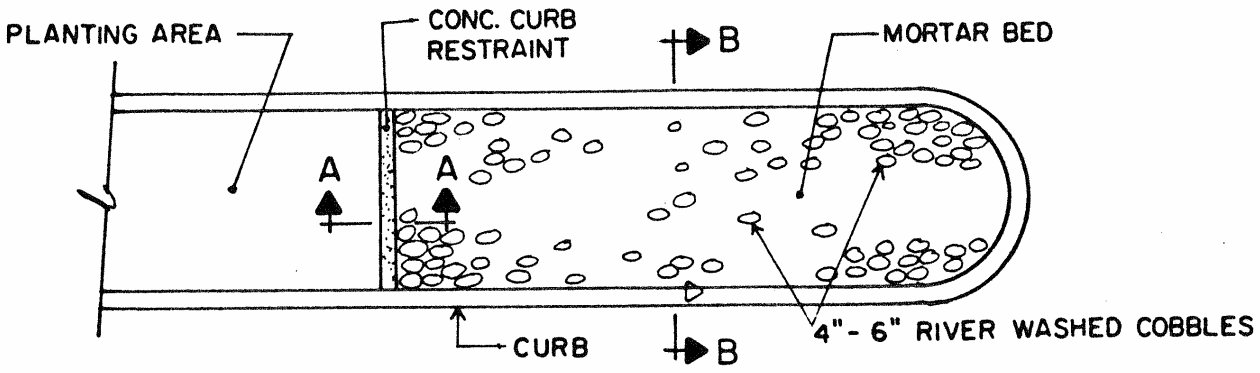
CITY OF SUNNYVALE CALIFORNIA

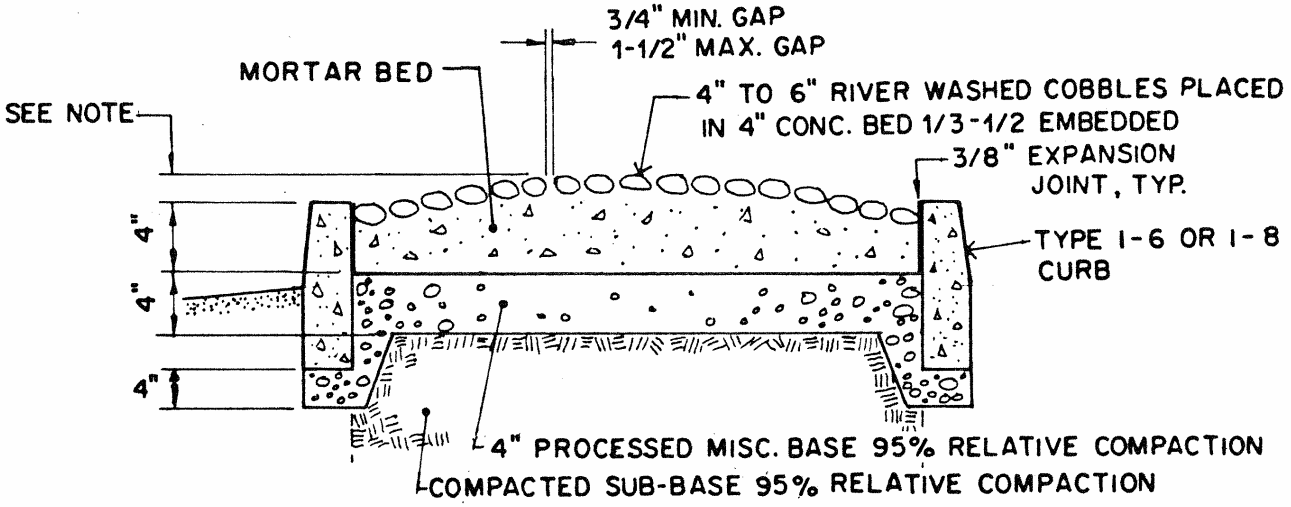
APPROVED

DATE JUNE 21, 2000

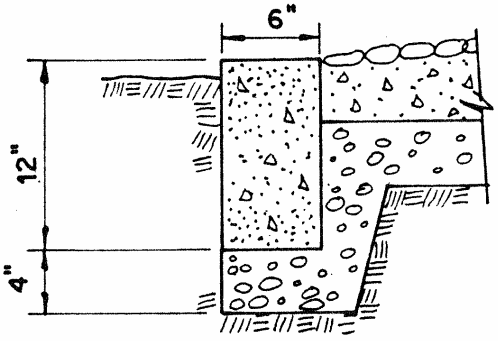
REV. DATE

DRWG 14F





SECTION B-B



SECTION A-A

NOTE: 2" MIN. CROWN ON 8' WIDE MEDIAN, INCREASING PROPORTIONATELY TO 4" CROWN ON 20' WIDE MEDIAN.

MEDIAN COBBLESTONE PAVING

CITY OF SUNNYVALE CALIFORNIA

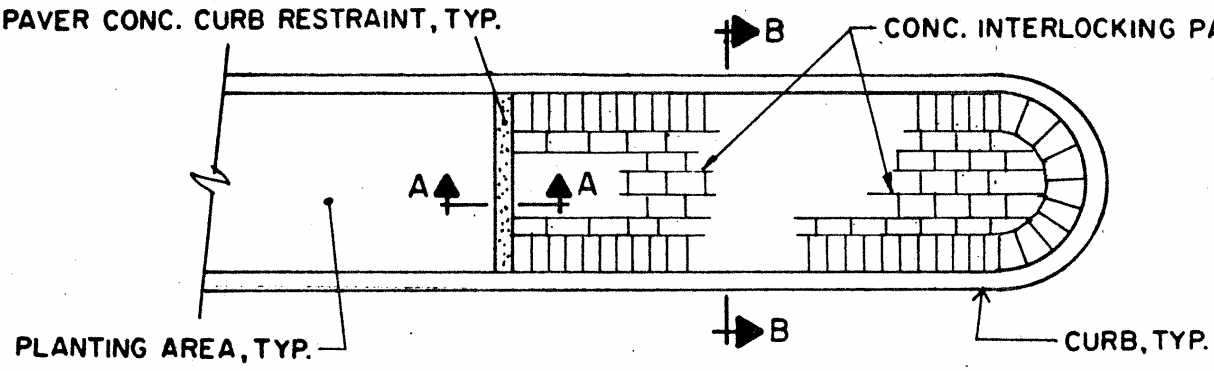
APPROVED

DATE JUNE 21, 2000

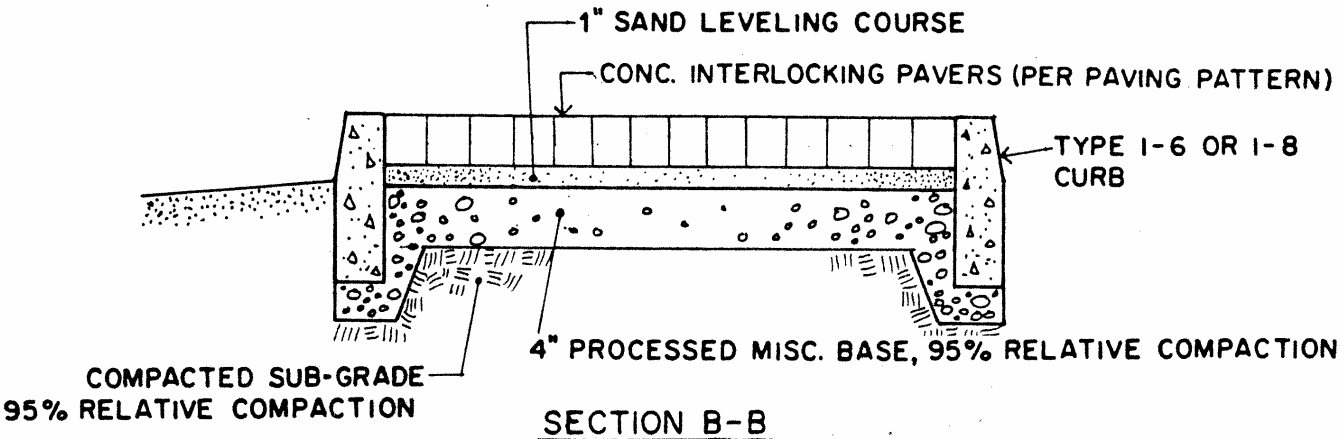
REV. DATE

DRWG. 15 F

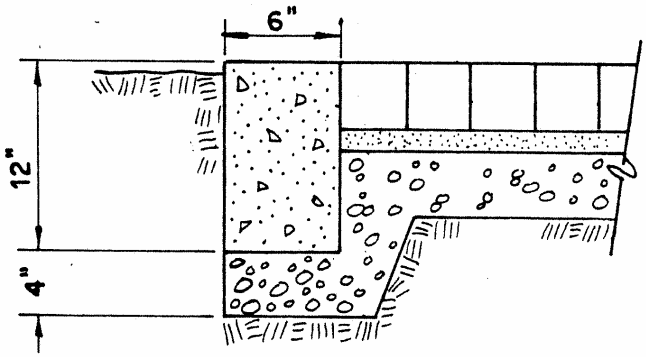
2000 STANDARD DETAILS



MEDIAN PAVING PATTERN, TYP.



SECTION B-B



SECTION A-A

NOTES: 1. CONCRETE INTERLOCKING PAVERS SHALL BE "ANTIQUE COBBLE" INTERLOCKING PAVERS BY PACIFIC INTERLOCK PAVINGSTONE, OR EQUAL.

2. PAVERS SHALL BE 5.1" X 7.6" X 2 3/8" THICK.

MEDIAN ARCHITECTURAL PAVERS

CITY OF SUNNYVALE CALIFORNIA

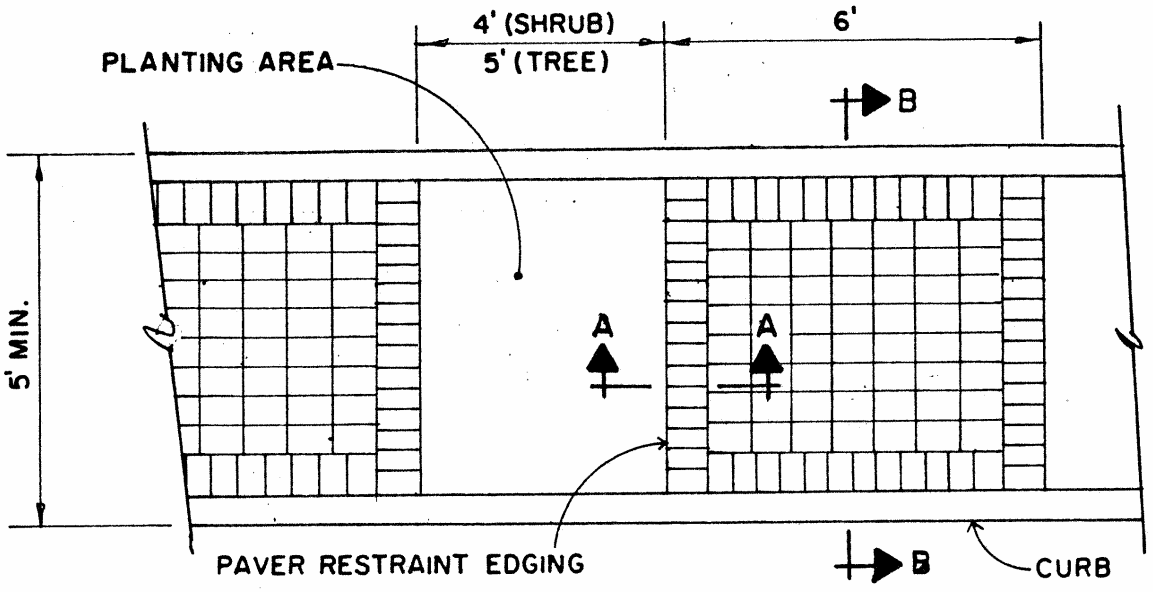
APPROVED

DATE JUNE 29, 2000

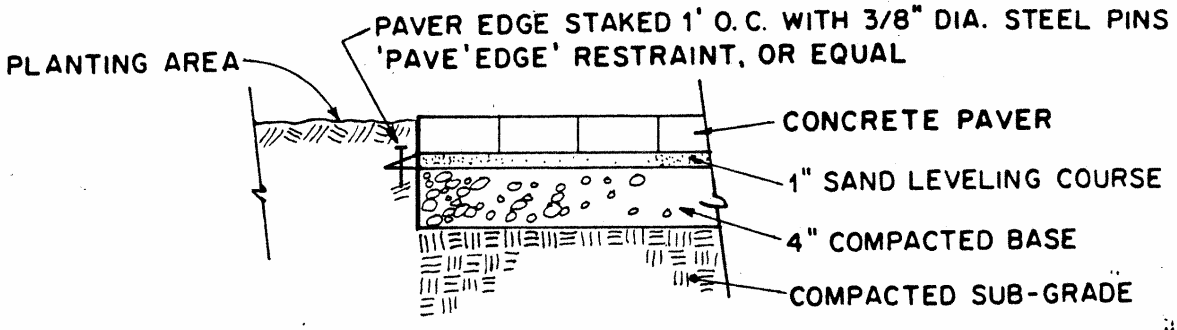
REV. DATE

DRWG. 16 F-1

2000 STANDARD DETAILS



PAVING PATTERN IN SHRUB/TREE AREAS, TYP.



SECTION A-A
PAVER RESTRAINT EDGING, TYP.

FOR SECTION B-B, SEE STD. DETAIL 16F-1

NOTES: 1. SEE NOTES 1. & 2 ON STD. DETAIL 16F.

2. PATTERN SHALL BE INSTALLED, ACCORDING TO THIS DETAIL, IN ARCHITECTURAL PAVING AREAS W/SHRUBS OR TREE POCKETS IN BETWEEN.

3. PATTERN SHALL BE APPLIED TO ARCHITECTURAL PAVING AREAS OF 5' WIDTH MEDIAN OR GREATER.

MEDIAN ARCHITECTURAL PAVERS W/SHRUB OR TREE POCKETS

CITY OF SUNNYVALE CALIFORNIA

APPROVED

DATE JUNE 30, 2000

REV. DATE

DRWG. 16F-2

2000 STANDARD DETAILS

[PROJECT TITLE]

A PROJECT OF

DEPARTMENTS OF PUBLIC WORKS AND XXXX

CITY OF SUNNYVALE

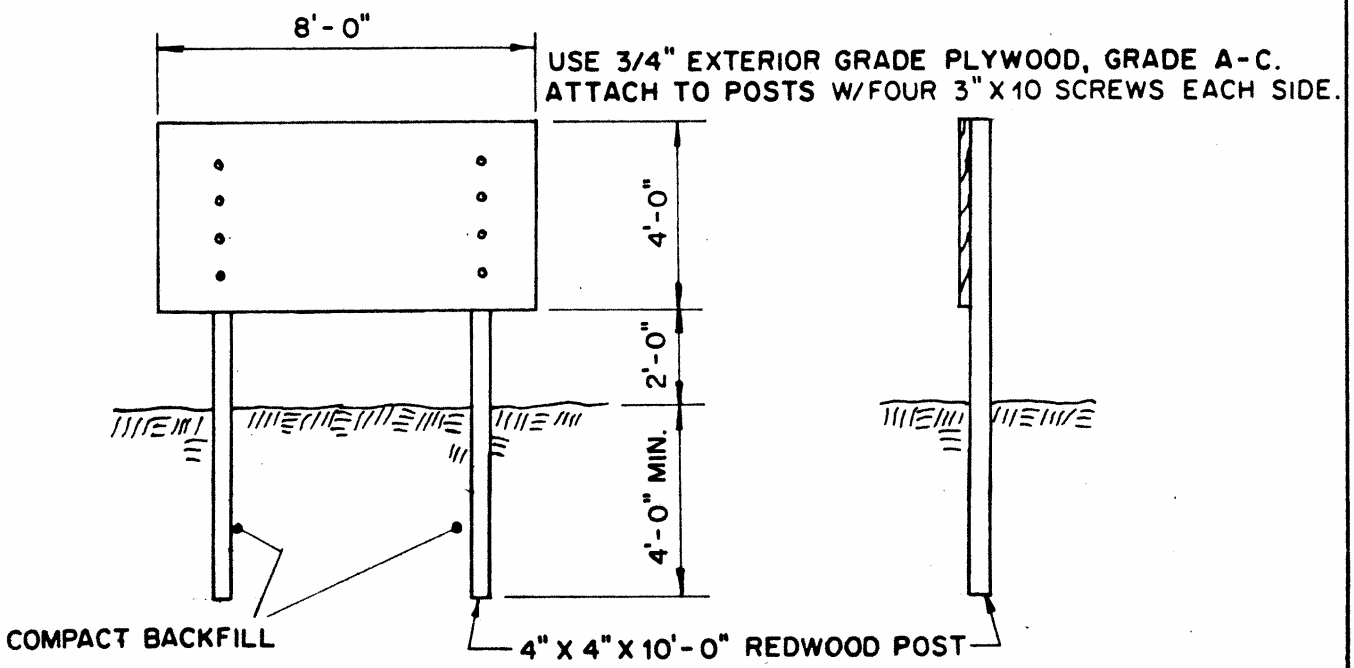
City Council & Manager

XXXX, Mayor	XXXX, Vice-Mayor
XXXX	XXXX
XXXX	XXXX
XXXX	XXXX, City Manager

SCOPE OF WORK:
[DESCRIPTION XXXX]

Scheduled Completion: XXXX **For Information:** Call XXXX

SAMPLE TEXT - EXACT TEXT TO BE PROVIDED BY CITY



PROJECT INFORMATION SIGN

APPROVED

DATE JULY 6, 2000

REV. DATE

DRWG. 1G

2000 STANDARD DETAILS